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Issues in Comparing Poverty Trends Over Time in Côte d'Ivoire

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Exploring poverty trends across regions and socioeconomic groups raises questions about the pattern of change and the reliability of the data and the methods used to derive poverty estimates. Secondary data cast some doubt on certain survey findings, suggesting that they may be more an artifact of survey data than a reflection of real economic trends.

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Summary findings

Côte d'Ivoire is one of the few countries in Sub-Saharan Africa that conducted household surveys between 1985 and 1995. These surveys make it possible to trace changes in urban and rural poverty and changes in poverty among different socioeconomic groups.

During the decade surveyed, the country experienced a major recession. Economic recovery began only with the devaluation of the CFA franc in January 1994. Poverty increased substantially during the recession and did not diminish in the year after devaluation, in part because much of the increase in export crop prices, especially for cocoa, was taxed away.

Moreover, the effects of the recession and devaluation were not uniform. Between 1988 and 1993, urban poverty increased faster than rural poverty did, though mean expenditures in urban areas remained substantially above mean expenditures in rural areas. And food crop farmers apparently suffered more than export crop farmers. These trends persisted after devaluation.

But exploring poverty trends across regions and socioeconomic groups raises questions about the patterns of change and the reliability of the data and the methods used to derive poverty estimates. Secondary data cast some doubt on certain survey findings, suggesting that they may be more an artifact of the survey data than a reflection of real economic trends.

These problems are not unique to Côte d'Ivoire. Results from surveys in Uganda and to a lesser extent Ghana have also raised issues of comparability.

The ability to draw reliable conclusions from time series data is crucial for our understanding of how policy reform affects poverty. Far more attention must be paid to comparison issues in designing surveys and analyzing data. Attention must also be paid to developing better regional and temporal price indices, if reliable time series data are to be generated for Sub-Saharan Africa.

This paper — a product of the Macroeconomics and Growth Division, Policy Research Department — is part of a larger effort in the department to understand the link between economic policy change and poverty. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Rebecca Martin, room N11-059, telephone 202-473-1320, fax 202-522-3518, Internet address rmartin1@worldbank.org. January 1997. (77 pages)

Issues in Comparing Poverty Trends Over Time in Côte d'Ivoire

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The authors are very grateful to Lionel Demery, Christiaan Grootaert, Lawrence Hinkle, and Roger Key for their useful comments on this paper.

Côte d'Ivoire is one of the few countries in Sub-Saharan Africa to have conducted household surveys over a ten year period between 1985 and 1995 that allow one to trace the evolution of poverty in urban and rural areas and among different socioeconomic groups. This ten year period spans an economic recession of major proportion and ends with the beginning of an economic recovery following the devaluation of the CFA franc in January 1994. Poverty increased substantially over the course of the recession, and did not diminish in the year following the devaluation in part because much of increase in export crop prices, especially cocoa, was taxed away.

Moreover, the impact of the recession and devaluation was not uniform. Between 1988 and 1993, urban poverty increased more rapidly than rural poverty, even though mean expenditure in the urban areas remained substantially above mean expenditure in rural areas throughout the period. And food crop farmers appear to have suffered more than export crop farmers. These trends persist after the devaluation.

However, an exploration of the poverty trends over time across regions and socioeconomic groups raises a number of questions about the pattern of change and about the reliability of the data or the methodology used to derive the poverty estimates. Secondary data cast some doubt on certain of the survey findings, suggesting that they may be more an artifact of the survey data than a reflection of real economic trends. These problems are not unique to Côte d'Ivoire; results from surveys in Uganda and to a lesser extent Ghana have also raised issues of comparability.[1] The ability to draw reliable conclusions from time series data is crucial for our understanding of the impact of policy reforms on poverty. Far more attention needs to be paid to the issues of comparability in designing surveys and analyzing data and also to the development of better regional and temporal price indices if reliable time series data on poverty is to be generated for sub-Saharan Africa.

Economic Crisis and the Increase in Poverty

Côte d'Ivoire's economic history is marked by a long economic boom period that ended in the early 1980s with the onset of a brutal economic recession. In the two decades following independence, Côte d'Ivoire achieved an impressive economic growth record. Real GDP per capita grew at 5.7 percent per year between 1960 and 1979, buoyed by strong growth in cocoa and coffee exports, favorable terms of trade, and growth in the manufacturing sector.

A decline in the coffee harvest in Brazil led to a dramatic increase in coffee and cocoa prices in 1976. The terms of trade increased by 58 percent between 1975 and 1977. The cocoa and coffee boom generated large surpluses for the Agricultural Price Stabilization Fund (CSSPA) of more than 10 percent of GDP. The government undertook a major investment program which was financed in part by the export crop revenues and a large increase in external borrowing. Investment rose to 26 percent of GDP on average between 1975 and 1979 (table 1).

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[1] See, for example, Appleton (1994) and Jones and Ye (1996).

Table 1 Selected Macroeconomic Indicators, 1975-1984

	1975	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*
Real GDP growth rates (% p.a.)										
GDP per capita	4.4%	8.1%	3.6%	7.8%	-1.0%	-15.4%	-0.2%	-3.8%	-6.6%	-6.4%
GDP	8.7%	12.4%	7.6%	12.1%	2.9%	-12.0%	3.8%	-0.1%	-3.0%	-2.7%
Consumption growth rate (% p.a.)										
Private	11.0%	12.7%	9.9%	11.8%	3.0%	-19.4%	2.3%	-3.7%	0.7%	3.7%
Public	11.1%	16.6%	7.7%	19.4%	8.1%	-24.0%	7.3%	-4.4%	0.0%	-8.4%
Gross domestic investment (% of GDP)	22.4%	23.0%	27.3%	29.8%	28.0%	26.5%	25.9%	23.2%	18.4%	11.2%
Central Government (% of GDP)										
Primary Balance						-6.4%	8.6%	-6.1%	3.2%	4.1%
Overall Balance						-8.5%	-12.1%	-11.5%	-9.0%	-3.0%
Prices										
Annual Change in CPI (%)	11.44%	12.05%	27.46%	12.93%	16.67%	14.63%	8.86%	7.31%	5.91%	4.25%
REER Index (1985=100)	93.7	87.3	97.3	99.4	101.9	133.9	112.8	111.5	104.6	99.1
Exchange rate (CFA francs per US$ annual average)	214.3	239.0	245.7	225.6	212.7	211.3	271.7	328.6	381.1	437.0
Terms of Trade (1985=100)	88.5	97.1	139.6	130.7	122.9	117.3	105.1	95.9	91.2	101.3

Table 1 Selected Macroeconomic Indicators, 1975-1984 (continued)

	1985	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*
Real GDP growth rates (% p.a.)											
GDP per capita	0.6%	-0.4%	-5.2%	-5.6%	-4.6%	-5.7%	-4.2%	-3.4%	-4.6%	1.9%	3.1%
GDP	4.5%	3.4%	-1.6%	-2.0%	-1.0%	-2.1%	-0.8%	0.0%	-1.1%	1.8%	7.0%
Consumption growth rate (% p.a.)											
Private	4.2%	4.8%	5.2%	-4.9%	-1.7%	-3.4%	-4.3%	-0.5%	-0.7%		
Public	0.0%	12.5%	1.4%	0.3%	-3.2%	-12.5%	-1.1%	-4.3%	-0.1%		
Gross domestic investment (% of GDP)	12.6%	11.4%	12.6%	14.4%	8.1%	8.5%	9.0%	8.1%	7.7%	11.8%	13.1%
Central Government (% of GDP)											
Primary Balance	9.9%	4.2%	-1.3%	-6.1%	-7.2%	-2.2%	-2.1%	-1.3%	-3.2%	1.4%	3.2%
Overall Balance	3.2%	-2.7%	-8.5%	-14.6%	-16.6%	-12.0%	-13.0%	-11.7%	-12.0%	-7.0%	-3.6%
Prices											
Annual Change in CPI (%)	1.86%	6.86%	6.95%	7.00%	1.03%	-0.83%	1.68%	3.58%	2.60%	25.80%	14.30%
REER Index (1985=100)	100.0	116.4	122.3	117.0	117.8	115.4	110.9	122.0	123.5	75.8	83.2
Exchange rate (CFA francs per US$ annual average)	449.3	346.3	300.5	297.8	319.0	272.3	282.1	264.7	283.2	555.2	499.3
Terms of Trade (1985=100)	100.0	102.2	91.5	87.4	78.2	75.2	75.5	72.6	70.8	76.9	85.4

Source: World Bank data.

The boom in prices did not last long, however, and by 1980 about half the gain in the terms of trade had been eroded. While the boom did not persist, the problems created by the large increase in spending and lack of monetary discipline did. Real GDP per capita declined in 1979 for the first time since 1960, and fell sharply in 1980. The macroeconomic situation deteriorated, as inflation persisted and the budget deficit grew due to difficulties in cutting back the large public investment program.

Faced with growing macroeconomic instability and a slow down in growth, in 1981 the government embarked upon an adjustment program.[2] While some progress was made in reducing the budget deficit and inflation, the continued slump in cocoa and coffee prices in the early 1980s, the impact of the tight monetary and fiscal policies, and a severe drought in 1983 contributed to decline in real GDP growth between 1982 and 1984. This was followed by a brief turnaround in growth in 1985, due to a good harvest in 1984/85, improved cocoa and coffee prices, and the depreciation of CFA relative to the US dollar. The brief turnaround was short-lived, however, as coffee and cocoa prices resumed their downward slide. The terms of trade fell by 13 percent between 1985 and 1988 while at the same time external competitiveness was eroded as the real effective exchange rate appreciated by 17 percent. In 1987 real GDP declined by 1.6 percent. In 1988 the recession deepened as real GDP fell by 3.6 percent. The government's fiscal position worsened as the government tried to protect farmers by maintaining cocoa and coffee producer prices at the level set in 1985. The deficit of the CSSPA reached 5.9 percent of GDP in 1989, contributing to worsening of the primary deficit, equal to 7.2 percent of GDP.

To restore growth and macroeconomic stability, in 1989 the government undertook a new wave of adjustment measures, the primary objectives of which were to reduce the primary fiscal deficit and to restore competitiveness through structural reforms and tight monetary and fiscal policy. In the absence of an nominal exchange rate adjustment,[3] the government attempted to achieve a depreciation of the real effective exchange rate by keeping Côte d'Ivoire's inflation rate below that of its main trading partners and increasing wage and price flexibility through labor market and other policy reforms. However, it did not address the issue of high civil service salaries. The government made massive cuts in public investment and also cut non-recurrent wage expenditures but the government wage bill continued to increase. Public investment expenditure fell from 9 percent of GDP in 1981 to 3 percent of GDP in 1993. This represented a drastic cut, as real GDP per capita fell by almost 40 percent over the same period.

However, the measures undertaken by the government were not sufficient to restore external competitiveness and growth. Between 1985 and 1993, the real effective exchange rate appreciated by 33 percent, due to the appreciation of the French franc against the US dollar, while the terms of trade deteriorated by almost the same amount. Real GDP per capita declined by 4.8 percent per year between 1987 and 1993. The decline in economic activity hit the tertiary sector hardest during the first part of the recession, while growth in the agricultural sector remained positive for the first several years of the period. Employment in the modern sector fell by six percent between 1985 and 1992, despite the growth in public sector employment. The overall decline in economic activity, combined with rapid population growth and continuing rural-urban migration contributed to a 61 percent rise in informal

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[2] For a discussion of the policies measures undertaken as part of Côte d'Ivoire's adjustment program and their economic impact, see Demery (1994).

[3] As a member of the CFA franc zone, Côte d'Ivoire's currency is pegged to the French franc. A nominal devaluation was long opposed by members of the zone.

sector employment over the same period (World Bank, 1995). Private consumption per capita fell by 31 percent between 1987 and 1995, consistent with the 35 percent fall in household expenditure per capita over the same period as measured by the household surveys.

Due to four years of Côte d'Ivoire Living Standards Survey (CILSS) data between 1985 and 1988 and two Priority Household Surveys (PHS) conducted in 1993 and 1995, it is possible to trace the evolution of poverty during this period of severe economic recession in Côte d'Ivoire, although the differences in the two types of surveys raise questions about comparability of the poverty estimates across surveys.[4] In 1985, the headcount index of poverty in Côte d'Ivoire was 11 percent based on the extreme poverty line of 75,000 CFAF per capita per year adopted by Grootaert (1996) shown in table 2. The 75,000 CFAF poverty line is close to the one dollar per day poverty line used in the 1990 World Development Report.[5] Between 1985 and 1993, poverty almost tripled, with almost three-fourths of the 26 percentage point increase occurring in the five year period between 1988 and 1993. Looking at the change in poverty by region and socioeconomic groups raises some questions about the validity of the data and about why certain groups fared better than others.

Declining per capita expenditures and increasing poverty, 1985-1988

Between 1985 and 1988 the decline in household expenditure per capita was greater in the urban areas than in the rural areas, setting aside for the moment the West Forest region (table 3). Mean per capita expenditures fell by almost 30 percent in Abidjan and 40 percent in Other Cities, compared to the 15 percent decline in East Forest and the 21 percent cent decline in the Savannah. Despite the large fall in household expenditure in Abidjan, there was no increase in poverty, since even in 1988 mean household expenditure per capita was still three times greater than the poverty line of 75,000 CFAF per year. The decline in expenditures in rural areas was accompanied by a large increases in poverty in West Forest and in the Savannah. West Forest registered the largest fall in expenditure, almost 50 percent between 1985-1988.

Between 1985 and 1988 per capita expenditure fell by 33 percent, a much larger fall than the decline in real private consumption per capita of 6 percent. The large difference in expenditure trends between the household surveys and national accounts estimates has not been accounted for. The large decline in household expenditure per capita and the increase in poverty in the West Forest region-- a cocoa and coffee growing region like the East Forest-- is especially puzzling. Household expenditure per capita in the West Forest was 50 percent higher than East Forest in 1985, but fell about 20 percent year, bringing it to a level below that of the East Forest in 1988. In 1985 and 1986, West Forest had a

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[4] The 1985-1988 household survey data come from the four Côte d'Ivoire Living Standards Surveys (CILSS) and are based on the expenditure aggregate described in Oh and Venkataraman (1992). The 1993 and 1995 data are taken from the Household Priority Survey (HPS). Changes to the cleaned 1993 and 1995 INS data files (as of March 1996) are described in Annex 1. The comparability of the methods used to estimate food expenditure in the CILLS and HPS surveys are discussed in Appendix B.

[5] Grootaert chose the 75,000 CFAF per day poverty line as the index of extreme poverty because it corresponded to a headcount index of 10 percent in 1985, based on the set of deflators he used. This paper uses the CPI series published by the INS as the basis for its deflators. For a discussion of the construction of the deflator series for the household surveys, see Appendix B. The 75,000 CFAF/day poverty line translates into $PP 410 (purchasing power parity), slightly exceeding the poverty line of $PP 370 (1985$PP) used in the 1990 World Development Report. This calculation is based on the purchasing power parity exchange rate for 1985 for private consumption of 182.85 CFAF/$PP from the Summers and Heston data which was used in Chen, Datt, and Ravallion's (1994) estimations of the incidence of poverty in developing countries.

poverty rate that was close to Abidjan, but then rose abruptly between 1986 and 1987. Was the West Forest region so much better off than the East Forest region in 1985 and 1986? If so, what would account for the dramatic decline in per capita expenditures over the four years?

Table 2 Headcount Index of Poverty by Region
(Poverty Line = 75000 CFAF per year in 1985 CFAF)

Region	*1985*	*1986*	*1987*	*1988*	*1993*	*1995*
Abidjan	0.007	0.014	0.018	0.004	0.051	0.202
Other Cities	0.080	0.064	0.059	0.125	0.312	0.286
East Forest	0.144	0.095	0.105	0.176	0.389	0.410
West Forest	0.016	0.019	0.105	0.193	0.382	0.501
Savannah	0.259	0.132	0.248	0.354	0.494	0.494
Côte d'Ivoire	0.111	0.069	0.115	0.178	0.323	0.368

Table 3 Mean Household Expenditure Per Capita by Region
(in 1985 CFAF per year)

Region	*1985*	*1986*	*1987*	*1988*	*1993*	*1995*
Mean expenditure per capita						
Abidjan	376108	308092	342923	267570	225274	186251
Other Cities	261867	258792	218578	158534	125445	118605
East Forest	164035	169269	156271	140286	101667	98269
West Forest	252047	202475	159314	130142	105986	96247
Savannah	142588	150127	126188	112673	86040	91240
Côte d'Ivoire	234867	218366	197680	158410	129306	121486
Index of mean expenditure per capita						
Abidjan	100.0	81.9	91.2	71.1	59.9	49.5
Other Cities	100.0	98.8	83.5	60.5	47.9	45.3
East Forest	100.0	103.2	95.3	85.5	62.0	59.9
West Forest	100.0	80.3	63.2	51.6	42.1	38.2
Savannah	100.0	105.3	88.5	79.0	60.3	64.0
Côte d'Ivoire	100.0	93.0	84.2	67.4	55.1	51.7

Grootaert (1995) explains the decline in the West Forest as largely a result of the decline in farm income. His analysis shows that West Forest export crop farmers suffered a decline of about 34 percent in farm income, due in part to the decline in the cocoa and coffee sales between 1985-1988 (table 4).[6] The quantity of cocoa sold declined by 51 percent per farmer, while coffee sales declined by 65 percent. In contrast, farm income of East Forest export crop farmers declined only by 18 percent, compared to a decline in cocoa sales of 11 percent and coffee sales of 33 percent.[7] The relatively better

[6] The farm income figures reported by Grootaert (1995) in his Table 9 are redeflated using the INS deflators and shown in Table 4.

[7] Our calculations of cocoa and coffee sales show a smaller decline in cocoa and coffee than Grootaert's. We omitted several large outliers where we suspected that the unit had been incorrectly coded as tons instead of kilograms, and discarded several observations where the unit of sale was nonstandard. The means are weighted and based on reported sales of all cocoa-growing households in the region. Based on our calculations, the survey data show that sales of cocoa by the cocoa-growing population declined by 3 percent in the East Forest between

performance of East Forest farm households is mirrored in the outcomes for food crop farmer households. Food crop farmers in the East Forest had a 19 percent decrease in farm income compared to the 52 percent drop in the West Forest. While the household expenditure data are more or less in line with the farm income data, they nonetheless beg the question of why West Forest farmers fared so much worse than East Forest farmers during this period.

Table 4 Farm Income of Farmers Across Rural Regions
(in 1985 CFAF per year)

	Percentage charge, 1985-1988	
Region	*Export crop farmer*	*Food crop farmer*
East Forest	-17.9	-3.5
West Forest	-33.6	-51.6
Savannah	-42.1	-18.6

Source: Grootaert (1995). Redeflated with the INS deflators.

Cocoa production data from other sources are at some variance with the household survey results for West Forest.[8] The cocoa production data, put together by Agricultural Price Stabilization Fund (CSSPA), are broken down by administrative department and reflect the estimation of cocoa production based on cocoa sales (table 5). The survey data show that sales increased by roughly 20 percent in the East Forest if we compare 1985 with 1987 or 1988 and decreased by roughly 40 percent in the West Forest. Trends in the survey data are roughly consistent with the CSSPA data for East Forest in that both show an increase in the 1986/87, 1987/88 and 1988/89 campaigns compared to 1984/85. The strong increase in the sales per household evident in the 1988 East Forest survey data is

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1985 and 1988, and by 28 percent in the West Forest. Coffee sales declined by 7 percent in the East Forest and by 47 percent in the West Forest over the same period.

[8] The CILSS surveys were fielded over the following periods:
1985: February 1985 to January 1986
1986: February 1986 to January 1987
1987: March 1987 to February 1988
1988: May 1988 to April 1989.
Most of the cocoa and coffee crop is purchased between November and March. Thus it is likely that the survey years of 1985 and 1986 will correspond to the cocoa and coffee marketing campaign years of 1984/85 and 1985/86. For the 1987 survey, some farmers will be reporting on the 1986/87 harvest, while others will be reporting on the 1987/88 harvest. And for the 1988 survey, some households will be reporting on the 1987/88 campaign year, while others will be reporting on the 1988/89 campaign year.

Table 5 Côte d'Ivoire: Cocoa Production By Region

CSSPA							*Survey estimates*											
	Cocoa production (1000 t)			*Production index (1984/85=100)*				*Production index (1985=100)*			*Production per capita (regional population) (kg)*			*Production per capita (cocoa-growing population) (kg)*			*Cocoa-growing population as share of regional population*		
Campaign year	*East Forest*	*West Forest*	*Total*	*East Forest*	*West Forest*	*Total*	*Survey year*	*East Forest*	*West Forest*	*Côte d' Ivoire*	*East Forest*	*West Forest*	*Côte d' Ivoire*	*East Forest*	*West Forest*	*Côte d' Ivoire*	*East Forest*	*West Forest*	*Côte d' Ivoire*
1982-83	138650	107358	260301	51	39	46													
1983-84	244833	187703	446640	90	69	79													
1984-85	271870	272551	563901	100	100	100	1985	100	100	100	109	72	39	198	146	171	0.55	0.49	0.23
1985-86	326592	285193	630955	120	105	112	1986	111	100	117	122	72	46	197	151	184	0.62	0.47	0.25
1986-87	299754	294852	610992	110	108	108	1987	117	67	102	127	48	40	174	101	154	0.73	0.48	0.26
1987-88	306516	337497	659145	113	124	117	1988	95	75	93	103	54	37	195	106	153	0.53	0.51	0.24
1988-89	396337	444784	867770	146	163	154													
1989-90	323736	389543	727686	119	143	129													
1990-91	318921	465390	799396	117	171	142													
1992-93	247633	431493	697030	91	158	124	1993	76	140	106	84	101	41	143	159	150	0.58	0.63	0.28
1993-94	305533	600414	917203	112	220	163													
1994-95	312369	559067	883329	115	205	157	1995	76	104	95	83	74	37	129	147	137	0.65	0.51	0.27

also evident in the CSSPA data for 1988/89, but the decline in the percentage of households growing cocoa in the 1988 in East Forest causes a decline in the survey regional sales index in 1988. In contrast, the sharp decline in the West Forest survey data in sales per capita among cocoa-growing households and also in the regional sales index between 1986 and 1987 is not at all evident in the CSSPA production data.

Another inconsistency between the survey and the CSSPA data concerns the distribution of production between the East and West Forest Regions. The survey data indicate that sales in East Forest far outstripped that in the West Forest, while the CSSPA data indicate that production in the West Forest was roughly equal to the East Forest in 1985 and then outstripped production in the East Forest. According to the survey data, cocoa sales per capita was roughly 36 percent higher in East Forest than in the West Forest in 1985. Since the population of East Forest was 66 percent higher than West Forest (based on the survey weights), overall cocoa production should have been 126 percent higher in East Forest than West Forest, extrapolating from the survey data. According to CSSPA data, however, cocoa production in East Forest equaled cocoa production in West Forest in 1984/85. The disparity between the survey and CSSPA data widens in 1988: according to the survey data, sales per capita in the East Forest were 91 percent higher than in the West Forest, with the East Forest having 53 percent more population. Thus, East Forest in principle would have produced 192 percent more cocoa than West Forest. The CSSPA regional production estimates, however, show that in 1988/89 West Forest produced about 10 percent more cocoa than East Forest.

A sharp break in coffee sales in West Forest between 1986 and 1987 is also clearly apparent in the survey data (table 6). The CSSPA data confirm that there was a fall in coffee production in the West Forest between 1985/85 and 1988/89, though the decline is not as dramatic as the fall in the survey data.

One problem with trying to match up the survey data with the CSSPA data is that urban areas within the forest region are considered either as belonging to Abidjan or Other Cities regions for the purposes of the household surveys. The CSSPA production estimates do not distinguish between the rural and urban areas within the Forest and Savannah regions. Even if we assume however, that in 1985, all the cocoa produced in Other Cities is attributable to the West Forest region, sales per capita in the West Forest would still far slightly below that of the East Forest. The disparity between the two regions in terms of total cocoa production would still be large, due to the difference in population size. And in 1988, even with the assumption that all cocoa sold by the households classified as living in Other Cities is attributable to the West Forest, per capita production in the West Forest would still be substantially below that of the East Forest. However, some of the disparity between the survey and the CSSPA production figures could be due to the possibility that households living in the East Forest reporting sales of cocoa may have actually grown cocoa in the West Forest. However, even if this were the case, it would not explain why sales declined so dramatically in the West Forest between 1986 and 1987, and not in East Forest.

Thus, the sharp decline in cocoa and coffee production in the West Forest survey data between 1986 and 1987 do not seem to be completely consistent with the CSSPA production data. The decline in per capita expenditures and thus the increase in poverty in West Forest may therefore be overstated to some degree. Indeed, there does seem to have been some sampling bias in the survey data. Demery and Grootaert (1993) hypothesize that sampling bias accounts for the decline in household size observed

Table 6 Côte d'Ivoire: Coffee Production By Region

CSSPA production estimates							*Survey estimates*											
	Coffee production (1000t)			*Production index (1984/85=100)*			*Production index (1985=100)*			*Production per capita (regional population) (kg)*			*Production per capita (coffee-growing population) (kg)*			*Coffee-growing population as share of regional population*		
Campaign Year	*East Forest*	*West Forest (Cherries)*	*All Green*	*East Forest*	*West Forest*	*Total*	*East Forest*	*West Forest*	*Côte d' Ivoire*	*East Forest*	*West Forest*	*Côte d' Ivoire*	*East Forest*	*West Forest*	*Côte d' Ivoire*	*East Forest*	*West Forest*	*Côte d' Ivoire*
1984-85	189967	270066	277	100	100	100	100	100	100	75	187	50	146	236	169	0.5	0.7	0.3
1985-86	207761	245111	265	109	91	96	121	93	118	91	174	59	154	213	180	0.5	0.8	0.3
1986-87	239095	226013	270	126	84	97	156	35	89	117	65	44	222	93	161	0.5	0.7	0.2
1987-88	134502	183586	187	71	68	68	64	43	59	48	80	29	136	125	126	0.3	0.6	0.2
1988-89	173132	182278	250	91	67	90												
1989-90			290			105												
1990-91			239			86												
1991-92			257			93												
1992-93			146			53	43	34	47	32	63	23	89	125	112	0.3	0.5	0.2
1993-94			148			53												
1994-95			196			71	38	17	33	28	33	16	71	93	84	0.4	0.3	0.1

across the surveys, with a particularly strong decline between 1986 and 1987. They reweighted the sample to correct this bias.[9] However, it is entirely possible that the reweighting scheme based on household size did not correct for other sampling biases which could have resulted in non-poor households being oversampled in 1985 and 1986 in West Forest.

An indication that there may have been other sampling problems in West Forest emerges from the comparison of the incidence of poverty in 1987 in the West Forest clusters that were retained from the 1986 sample and those that were added in 1987 to replace the ones that dropped out. The new clusters added in 1987 had three times the incidence of poverty as the old clusters. This was not just the case of high poverty clusters in 1987 replacing high poverty clusters in 1986: the clusters that were dropped from the 1986 sample did not exhibit a higher incidence of poverty in 1986 relative to the ones that were retained. While not conclusive, the difference in the incidence of poverty between the two sets of clusters suggests that there may have been some bias in the sampling design at some point.

The survey results for the Savannah are also somewhat surprising. While export crop farmers at least in the East Forest seemed to have been protected from the worst of the recession in 1987 and 1988, Savannah farmers did not fare so well. Mean expenditures per capita declined around 30 percent between 1985 and 1988 among both export and food crop farmers, although export crop farmers suffered a larger drop in farm income than food crop farmers. The production of cotton, the main export crop of the region, increased substantially over this period (table 7), so even with the real decline in cotton prices, the large decrease in mean household expenditures and farm income among export crop farmers in the Savannah is somewhat surprising.

Table 7 Cotton Production: National Estimates and Household Survey Results

National Estimates			*Survey Results*				
Campaign year	*Production (1000 t)*	*Production index (1984/85=100)*	*Survey year*	*Production per capita (cotton-growing households)*	*Production per capita (all households)*	*Cotton growing population as share of survey population*	*Production Index*
1984-85	212.0	100	1985	222	19.1	8.6	100
1985-86	189.3	89	1986	338	24.3	7.2	127
1986-87	213.5	101	1987	287	34.2	11.9	179
1987-88	255.8	121	1988	254	27.7	10.9	145
1988-89	290.4	137					
1989-90	241.7	114					
1990-91	261.1	123					
1991-92	193.8	91					
1992-93	238.8	113	1993	310	16.7	5.4	87
1993-94	258.3	122					
1994-95	209.0	99	1995	374	16.1	4.3	84

Accelerating increase in poverty, 1988-1993

As the economic recession deepened between 1988 and 1993, poverty in Côte d'Ivoire more than doubled. The increase was particularly strong in Abidjan, where poverty increased tenfold. With the large increase in poverty in Abidjan and to a lesser extent in Other Cities, the contribution of urban areas to the headcount index of poverty increased by more than 60 percent between 1988 and 1993

[9] The poverty results for 1985-1988 presented in this paper take account of the reweighting scheme proposed by Demery and Grootaert (1993).

(table 8). The percentage decline in mean urban incomes was slightly less than the decline in rural incomes, however. One might have expected the agriculture sector (and therefore the rural sector), as the most important producer of tradables, to have fared much worse than the urban sector, but that does not appear to have been the case.

Table 8 Urban and Rural Contribution to Poverty
(Poverty line = 75,000 CFAF per year in 1985 CFAF)

	Contribution to headcount index of poverty			*Share of population*		
	1985	*1988*	*1993*	*1985*	*1988*	*1993*
Urban	16.7	15.7	25.7	41.4	38.7	42.9
Rural	63.3	84.3	74.3	58.6	61.3	57.1

It is also curious that export crop farmers fared somewhat better than food crop farmers, who are largely producers of nontradables (except for rice, the price of which was controlled by the government and allowed to decline in real terms prior to the devaluation). Within the rural areas, poverty increased much faster among food crop farmers than export crop farmers between 1988 and 1993. In 1988, export and food crop farmers had roughly the same incidence of poverty (Grootaert, 1996).[10] By 1993 the incidence of poverty was some 10 percentage points higher among food crop farmers than among export crop farmers (table 9). This is somewhat surprising because there was a large decline in real export crop prices, particularly cocoa, which declined over 50 percent between 1988 and 1993 (table 10). In contrast, real staple food prices declined between 20 percent to 30 percent between 1988 and 1993 (table 11), not quite as much as real export crop producer prices. So all other things being equal, we would have expected food crop farmers to have been relatively more insulated from the recession than export crop farmers.

A partial explanation for the finding may be that the decline in producer prices had already been absorbed in the 1988 survey results. There is some evidence that farmgate cocoa and coffee producer prices were lower than official prices before the prices were officially lowered in 1989 (Azam, 1994). Food crop farmers may have also suffered disproportionately to the extent that they provided wage labor for export crop farmers, and wages or employment fell. There is, however, little information about the behavior of the rural labor market available.

The decline in real staple food prices merits some comment. Several factors may have been responsible. One factor is that as the real returns to cocoa, coffee and cotton production fell in the second half of the 1980s, farmers may have shifted some resources out of export crop production into the production of staple food crops, thus increasing the supply of staples and putting downward pressure on staple food prices. As the recession intensified and incomes fell, demand for staple foods fell as well (except perhaps for staples such as maize and cassava that are inferior goods). Finally, the decline in the real price of rice--due in part to government's pricing policy--also likely placed downward pressure on the real price of other staple food crops.

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[10] Unfortunately, the aggregate data file we obtained for the 1985-88 LSMS data does not include the socioeconomic group variable so we cannot reproduce Grootaert's results using the INS deflators. In 1988, the poverty incidence, using his deflators, was .210 for export crop farmers and .197 for food crop farmers, based on the 75,000 CFAF poverty line.

Table 9 Headcount Index of Poverty among Farm Households, 1985-1993

(poverty line = 75,000 CFAF per year in 1985 CFAF)

Socioeconomic Group	1985	1988	1993
Export crop farmers	.086	.210	.394
Food crop farmer	.150	.197	.492

Source: 1985 and 1988: Grootaert (n.d.).
1993: Household Poverty Survey.

Note: Poverty indices for 1985 and 1988 are calculated using Grootaert (1995) deflators, rather than the INS deflators. See Appendix B for a discussion of the difference in the two sets of deflators.

Table 10 Official Export Crop Producer Prices

Campaign Year	*Cocoa*	*Coffee*	*Cotton*	*Consumer Price Index*	*Real Producer Price Index (1984/85 = 100)*		
					Cocoa	*Coffee*	*Cotton*
1984/85	375	385	115	104.7	100.0	100.0	100.0
1985/86	400	200	115	111.1	100.5	48.9	94.2
1986/87	400	200	115	118.5	94.3	45.9	88.4
1987/88	400	200	115	126.6	88.2	42.9	82.7
1988/89	400	200	115	128.0	87.2	42.5	81.8
Jul-89	250						
1989/90	200	200	115	126.7	44.1	42.9	82.6
1990/91	200	100	100	128.9	43.3	21.1	70.6
1991/92	200	100	90	134.5	41.5	20.2	60.9
1992/93	200	170	90	138.3	40.4	33.4	59.2
1993/94	200	170	90				
Jan-94	240	220	105				
Mar-94	290	275	105	173.7	46.6	43.0	55.0
Sep-94	315	530					
1994/95							
Feb-95	315	650	160	198.1	44.4	89.2	73.5
Sep-95	315	695	170				

Note: Campaign year is from October to September. CPI series is on a calendar year basis.

Table 11 Staple Food Prices, Deflated by CPI *(1993=100)*

	Yams									
Year	*Assawa*	*Bete*	*Flori*	*Kingle*	*Kponan*	*Plantain*	*Manioc*	*Maize*	*Millet*	*Rice*
1987	151.5	117.5	128.6	127.0	153.8	120.3	143.3	128.1	111.5	138.1
1988	134.8	102.4	119.5	130.2	132.9	119.8	120.0	130.2	135.3	121.2
1989	125.9	103.2	110.5	118.2	121.2	105.6	105.4	116.8	122.9	119.4
1990	129.2	106.2	114.6	108.7	131.3	119.7	109.8	116.2	114.1	116.2
1991	113.3	92.9	97.5	106.2	107.6	97.0	108.1	118.2	119.9	111.6
1992	98.4	85.7	88.9	84.2	101.5	97.7	103.5	96.4	108.0	104.7
1993	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1994	86.1	78.5	81.5	81.2	87.2	87.8	84.2	76.1	82.3	84.6
1995	85.4	74.6	78.6	78.8	90.0	100.5	79.0	85.0	68.6	96.7

Note: Price data obtained the office d'Aide à la Commercialization des Produits Vivriers. Price data covers 10 markets in Côte d'Ivoire and is collected monthly. Mean price for each commodity was obtained by regressing logarithm of the price on dummies for years, markets, and month of observation. Nominal prices were deflated by the CPI series shown in Table 10.

The Devaluation and Macroeconomic Performance

The CFA franc was devalued in January 1994 by 100 percent in domestic currency terms. The devaluation was expected to reverse the eight years of negative real GDP per capita growth. Although real GDP growth per capita declined by 1.9 percent in 1994, that was an improvement over the 3.9 percent decline in 1993. The fiscal position of the government was improved due to the substantial export tax revenues it was able to collect by not passing through the increase in export earnings (in local currency terms) due to both the devaluation and the surge in the international price of cocoa, coffee and cotton. Prior to the devaluation, cocoa and coffee farmers were receiving approximately two-thirds of the c.i.f. export price. Immediately after the devaluation, they received about one third of the c.i.f. price. These ratios were adjusted upwards in the following campaign years. The indicative cocoa producer price relative to the average export price rose to 43 percent in the 1995/96 campaign, while for coffee the ratio more than doubled, rising to 78 percent in 1995/96. Despite the fact that the ratio of the producer price to the export price declined for cocoa, the real cocoa producer price did increase, albeit not dramatically. Coffee prices, on the other hand, more than doubled in real terms.

The turnaround in the economy was more pronounced in 1995.[11] Real GDP growth increased by 7 percent in 1995, implying a real growth rate per capita of 3.1 percent. Export growth increased by 9 percent, in part reflecting the more than 14 percent increase in the terms of trade in 1995. There was a major turnaround in domestic demand, which grew at 13.7 percent in 1995 compared to the 2.7 percent decline in 1994. Total investment rebounded strongly, increasing in 1995 by about 39 percent in volume, up from the 16 percent increase in 1994. Private consumption grew at 7.2 percent in 1995, in contrast to the decline of 6.7 percent observed in 1994, largely due to the decline in purchasing power following the devaluation. Growth in the primary sector was 6 percent in 1995 compared to 4 percent in 1994, due in part to the strong growth in agricultural exports, especially coffee, but especially to the expansion of the petroleum sector. Manufacturing increased by more than 10 percent in 1994, with the strong increase due in part to the coming on stream of new oil and gas fields. Capacity utilization increased from 76 percent in 1993 to an average of about 85 percent in the first three quarters of 1995. All branches of the tertiary sector registered positive growth in 1995, in contrast to 1994. The tertiary sector also registered strong growth of 10 percent, with the growth in export crops and import substitution having a positive effect on domestic transport and commerce.

The Impact of the Devaluation on Poverty

This section examines the expected effects of the impact of devaluation on household real expenditures. Essentially, the two channels through which a devaluation operates on real household expenditure is through its effect on consumer prices and its effect on incomes. While a common approach to tracing the expected impact of the devaluation on real household expenditures to use a two good, tradable/nontradable model, in the case of Côte d'Ivoire, it makes more sense to consider a three good model where the tradable sector is broken down in exportables and importables.[12] The distinction

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[11] The data for 1995 are from Côte d'Ivoire (1996).

[12] We follow the lead of Hinkle and Nsengiyumva (1995b) in their discussion of the three good model and its relation to various measures of the internal exchange rate by referring to the three sectors as importables, exportables, and nontradables. In practice, as they point out, when internal exchange rate measures are calculated, data limitations often force one to use indices for import, export, and domestic production in calculating the relevant price indices.

between importables and exportables is important, because of the changes terms of trade that occurred at the same time as the devaluation, and also because of differences in domestic taxes on importables and exportables.

As we discuss below, on the price side, the evidence shows that there was relatively little difference in the increase in the prices of tradable and nontradable consumer goods. Thus, one would not expect that the impact of the devaluation would vary significantly among socioeconomic groups. The relatively similar composition of their consumption baskets would also tend to reduce differences in the impact of the devaluation. The impact of the devaluation on real incomes earned from production of exportables and nontradable goods (or wages in these sectors) is likely to be a far more important determinant of how different households fared. This section looks at some of the theory and evidence for what we would expect to have happened on the consumer price and income side, and then compares the expected outcomes with the household survey results based on the 1993 and 1995 surveys.

Devaluation, inflation, and the implications for poverty

Côte d'Ivoire was among the more successful of the CFA franc zone countries in containing inflation following the devaluation of the CFA franc by 100 percent in local currency terms. In 1994, inflation (based on the blue collar consumer price index) at the end of the first year following the devaluation was 32 percent. At end 1995, prices had risen a total of 44 percent since the devaluation. The relatively low rate of overall inflation was due to imported prices rising less than would be expected assuming a simple doubling of prices in local currency, to the small rise in wages, and also to the subsidies on rice consumption which accounts for 5 percent of the consumption basket.

As Leenhardt and Massuyeau (1995) point out, there was not, however, a large difference in the behavior of prices of consumer tradable and nontradable goods.[13] They found a difference of ten percentage points in the tradable (largely imported consumed goods) and nontradable consumer price index between the period December 1993 to December 1994.[14] Based on a similar classification of the CPI, we found that the price index for tradable goods, which account for 46.5 percent of the CPI (table 12), rose 155 percent between December 1993 and April 1995, while the price index for nontradable goods rose 140 percent (table 13).[15] This difference would be even smaller if one were to use the expenditure shares generated by the survey results.[16]

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[13] This should not be interpreted to mean that the real exchange rate did not depreciate significantly. The tradable component of the CPI is comprised of goods that are primarily imported or goods that are domestically produced close substitutes for imported goods. The CPI-based price index for tradable goods in all likelihood does not accurately the index of prices of all imports, including capital and intermediate goods, that would be used in computing the internal real exchange rate for imports. The closest comparison to the calculation based on CPI tradable and nontradable price indices would be the estimate of the internal real exchange rate for imports, valued at domestic prices relative to the price of nontraded goods. This is not the same as the change in the internal real exchange rate based on an index of traded good prices, where traded goods comprise both imports and exports. The change in the real effective exchange rate between 1993 and 1995 was 33 percent. For a discussion of the interpretation and calculation of these different measures of the real exchange rate, see Hinkle and Nsengiyumva (1995a and 1995b).

[14] Locally grown cereals and starchy crops were classified as nontradables.

[15] Household expenditures were divided into domestic and traded goods following the classification of Grootaert (1996). Most food products (except meat, rice, wheat products, milk products, sugar, salt, tomato paste, bouillon cubes, refined oils and drinks, vehicles and gasoline) and all services were classified as domestic goods, while purchased household goods, drugs, and clothing were classified as tradables.

Table 12 Share of Tradable and Non-Tradable in the Consumption Basket *(percent)*

	CPI			1993 Survey		
Expenditure Categories	*Expenditure share*	*Tradable share*	*Non-tradable share*	*Expenditure share*	*Tradable share*	*Non-tradable share*
Food	48.0	47.8	52.8	47.4	35.6	64.4
Lodging	7.8		100.0	12.6		100.0
Utilities	8.5		100.0	5.8		100.0
Household furnishing	3.4	100.0		1.4	100.0	
Clothing[a)]	10.1	100.0		6.7	84.6	15.4
Transport	6.8	100.0	100.0	7.0	23.2	76.8
Vehicles	5.4	81.8	18.2			
Household maintenance	0.6	100.0		0.2		100.0
Hygiene	1.0	100.0		2.1	100.0	
Health	0.7	96.6	3.4	4.6	72.8	27.2
Education	1.0	29.5	80.5	3.3	41.5	58.5
Miscellaneous	6.7	45.7	54.3	1.0		100.0
Non-food in kind				0.2		100.0
Remittances				7.6		100.0
Total	100.00	46.5	53.5	100.0	32.5	67.6

[a)] The clothing category in the 1993 priority survey includes expenses for hairdressers and tailors, which were classified as non-tradable.

Table 13 Evolution of the Tradable and Non-tradable Components of the CPI[a)]

	April 1995		*January 1996*	
Components of the CPI	*Tradable*	*Non- tradable*	*Tradable*	*Non- tradable*
Food	146.3	150.3	155.5	133.9
Total	155.3	139.7	159.3	133.4

[a)] CPI index is the INS index for "ouvrier, employé qualifié on artisan traditionnel." Base period is October 1992 to November 1993. For the breakdown of posts into tradable and non-tradables, see text.

What are the implications for poverty? To the extent that there is relatively little differentiation in the rise of nontradable and tradable goods prices in the CPI consumption basket, differences in the share of importables in the consumption basket across socioeconomic groups or between the poor and nonpoor will have relatively little influence on poverty outcomes. Moreover, in 1993 there was relatively little difference between the poor and nonpoor population in the share of tradables in total household expenditure (table 14). The nonpoor consume slightly less tradables than the poor, given that they have a higher share of expenditure on lodging. The two factors taken together suggest that in terms

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[16] Based on the expenditure shares generated by the survey, we found that 35.2 percent of household consumption in 1993 was on tradables, compared to 46.5 percent in the CPI (table 12). Remittances, which account for 7 percent of the survey basket, but do not figure into the CPI basket, were classified in the same proportion as the remainder of the consumption basket. The difference in the share of tradables between the CPI basket and the survey basket is due primarily to the fact the share of nontradables in total food expenditure is higher in the survey--75 percent compared with 53 percent in the CPI basket. The reason for the smaller percentage point difference in the price indices for tradables and nontradables in the survey basket is due primarily to the larger share of nontradable food in the survey basket. Because of the large seasonal price increases for starchy food, the index for nontradable food prices was actually greater than that of traded food products in April 1995 though by January 1996 the situation had reversed itself (table 13).

of the impact of price changes on consumption, the devaluation had relatively little differential impact on the consumption basket of the poor relative to the nonpoor. The devaluation increases the share of tradables among both the poor and the nonpoor. The poor show a slightly larger increase bringing their share of consumption of tradables closer to the nonpoor. Thus, far more important to outcomes for the poor is what happened to their real income. That of course depends on what the particular source of income was, as the devaluation was accompanied by changes in tax policy which varied by crop and also by changes in the terms of trade.

Table 14 Mean Share of Tradable Household Expenditure and Food Expenditure

	1993		1995	
Region	*Share of tradable expenditure*	*Share of tradable food*	*Share of tradable expenditure*	*Share of tradable food*
Abidjan				
Poor	0.354	0.469	0.384	0.491
Non-poor	0.332	0.441	0.352	0.486
Other Cities				
Poor	0.355	0.418	0.408	0.446
Non-poor	0.361	0.426	0.399	0.474
East Forest				
Poor	0.273	0.238	0.332	0.307
Non-poor	0.304	0.292	0.336	0.312
West Forest				
Poor	0.334	0.368	0.403	0.408
Non-poor	0.337	0.333	0.399	0.424
Savannah				
Poor	0.255	0.244	0.301	0.301
Non-poor	0.259	0.244	0.287	0.279
Côte d'Ivoire				
Poor	0.303	0.311	0.358	0.367
Non-poor	0.328	0.365	0.355	0.404

Sources of income and the impact on poverty

In theory, one would expect that real product wage of tradables to be bid up relative to nontradables to bring about a reallocation of labor from nontradables to tradables.[17] Depending on the share of tradables goods in the consumption basket, and the size of the nominal wage increase, wage laborers who consume relatively few tradables could still benefit from the fall in the product wage. While in theory wages should equalize across sectors, in practice there may be some segmentation between the urban and rural labor market, or even within the rural labor market. In the short run real consumption wages in the tradable sector are likely to be bid up to attract labor. Thus, wage earners in the tradable sectors would have been the most likely to have benefited from the devaluation. Whether they benefited, however, depends on the size of the wage increase and the share of tradables in their consumption basket.

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[17] See World Bank (1990) for a discussion of the impact of devaluation on wage earners and farm households.

For households that are producers of both tradables and nontradables-- largely farm households that produce primarily exportables or nontradable food crops--the impact of the devaluation on their real expenditures would depend on whether they are net sellers or buyers of goods and labor.[18] Abstracting for the moment from the fact that changes in the prices of exports and imports may not be uniform, whether net sellers of tradables who are net buyers of labor would benefit depends on whether the gain in the revenue from the rise in the price of tradables (relative to the price of nontradables) exceeds the additional cost associated any increase in the wage rate. The lower the elasticity of the wage rate to the price of traded goods, the more likely they are to benefit. The reverse would be true for net buyers of traded goods who are net sellers of labor; the higher the elasticity of the wage rate to the price of traded goods, the more likely they would be to benefit from the price increase of traded goods.

Since consumption of domestic goods, particularly food, is relatively high, most export crop producers could be assumed to be net sellers of traded goods. Smaller farmers are also more likely to be net sellers of labor. Therefore, there is a high probability that in theory poor export-crop farming households would benefit from the rise in the price on exportables.

The above discussion assumes that the price increase in exportables and importables is the same. However, to the extent that export prices rise less than import prices due to government tax and pricing policy, even households that were net sellers of tradables prior to the devaluation might lose out if the increase in the cost of the imports they consume exceeds the additional revenue they earn from the production of exports. In Côte d'Ivoire, the improvement in the terms of trade that occurred at the same time as the devaluation meant that export prices increased more than import prices (at the border). However, government taxed away much of the benefit of the export price increase, although the rate varied by export crop. Thus, one cannot not assume that the impact of the devaluation and associated policies was identical across households classified as export crop farmer households. The more the gain in export prices was taxed away, the less likely the reduction in poverty for that group of export crop farmers.

Farmers who specialize in the production of nontradables, such as most staple food crops, would lose out from the rise in the relative price of tradable to nontradables if they were net sellers of nontradables as well as being net buyers of labor. If they are net sellers of labor, which is more likely, they could benefit even if they are net sellers of domestic goods if their additional earnings from hiring out their labor exceeded the additional cost associated with purchasing tradables. This would imply a relatively high elasticity of the wage rate with respect to the price of nontradables, particularly imports and close import substitutes. If they were net sellers of labor as well as being net buyers of nontradables, in principle they would benefit from the devaluation. But it would seem far more likely that they would be net sellers of nontradables, since virtually all of their farm income is likely to come from production of nontradable food crops.

In assessing the impact of the devaluation and associated policies on different categories or rural households, one needs to look carefully at what happened to the prices of tradable and nontradable agricultural goods. With respect to export crop prices, there was considerable variation in the real price increase depending on the extent to which the government taxed away the benefits of the devaluation and international price rises. The real producer price of cocoa increased by 10 percent and cotton 24 percent, while the real price of coffee jumped by 167 percent (table 10). Farmers specializing more in coffee would obviously have benefited far more than those cultivating primarily cocoa. With respect to cotton, in the campaigns following the devaluation, the policy was changed to require farmers to finance

[18] See Ravallion (1990) for a discussion of the conditions under which farm households will benefit from price changes.

the inputs upfront. The removal of what was essentially an interest-free loan on the cost of the inputs had some financial costs for farmers. Due to the relatively small real price increase in cocoa and cotton, one cannot necessarily conclude that all export crop farmers were better off as a result of the devaluation. Cocoa farmers whose incomes also depended heavily on domestically produced staple food crops or who consumed a higher than average share of imports could well have suffered a decline in real expenditures.

On the food crop side, the real price of locally produced staple food crop prices declined. If one looks at the staple food component of the blue collar CPI, between December 1993 and December 1994, the real price of staple foods actually decreased (table 15). Between 1994 and 1995, the staple food index had essentially caught up to the overall price index. Breaking it down into the importable and nontradable foodstuffs, however, shows that most of the price increase was in the price of importables rather than nontradable foodstuffs. Between December 1993 and December 1995, the price of imported staple foods (essentially rice and wheat products) increased by 67 percent, compared to a 29 percent increase in locally produced staple foods. Over the same period, the CPI increased by 44 percent, so there was actually a decrease in the real price of locally produced foodstuffs of about 11 percent (table 15). Our analysis of the staple food price data collected across ten markets in Côte d'Ivoire shows that real staple food prices declined anywhere from 0 to 20 percent depending on the particular product between 1993 and 1995 (table 11). Only the real price of plantains remained stable, according to the market price data. In view of the decline in staple food crop prices, one would expect an increase in poverty among farmers specializing in staple food crop production.

Table 15 Index of Prices of Staple Foods, 1993-1995[a)]

Expenditure item	*CPI price index*		
	December 1993	*December 1994*	*December 1995*
Tradable staple foods	100	129.2	166.7
Rice	100	126.2	178.3
Macaroni	100	189.5	194.0
Bread	100	127.9	127.9
Non-tradable staple foods	100	114.0	128.8
Maize	100	117.1	123.5
Millet	100	117.7	121.0
Manioc	100	94.1	111.8
Attiéké	100	133.0	172.9
Yams	100	144.8	137.1
Potatoes	100	164.0	120.7
Plantain	100	101.4	121.7
Staple foods	100	120.4	144.9
CPI	100	132.2	142.4

[a)] Indice des prix (ouvrier, employé qualifeé ou artisan traditionnel.)

These observations suggest that the impact of the 1994 devaluation of the CFA franc is likely to be less favorable than suggested by Goreux (1995). He argues that in the presence of good rainfall in the year following the devaluation, it is reasonable to think that consumption of home production did not diminish in the rural areas. Export crop producers would have benefited, particularly those producing coffee. Furthermore, it is likely that food crop producers benefited as well, since the CPI indicates that staple food prices went up at the same rate as the devaluation, and transport costs did not. All in all, he argues that it is likely that the monetary revenue of the rural population increased after the devaluation.

However, the price of nontradable staple food prices did decline. Moreover, the fact that the imputed value of home consumption likely fell in real terms must be factored into the analysis. When it is, and when account is taken of the fact that real cocoa prices did not increase substantially, there is reason to think that in the short run following the devaluation, poverty would have increased, or at least failed to decrease, among a substantial segment of the rural population.

Household survey results

Two household expenditure surveys are available that allow us to trace the short-run impact of the devaluation on poverty. The pre-devaluation survey was carried out between June and November, 1993, except Abidjan, which was carried out in March-April 1992. A total of 9600 households were surveyed. The post-devaluation survey, with a much smaller sample of 1000 households, was carried out in April-May 1995. With several exceptions, we maintained the INS data as it was processed, cleaned, and aggregated. The data take into account the change that was made to the consumption of home production data to correct an error made in computer data entry, as described in Appendix C. We also re-estimated the housing expenditure variable and changed the definition of agricultural workers to correct some inconsistencies, described in Appendix A.

In view of the fact that GDP growth per capita was negative in 1994, one would expect that the devaluation would not have had a strong impact on reducing poverty by early 1995, when survey results are available. Overall, the survey results, based on the cleaned INS data set (table 2), show that the incidence of poverty increased from 32.3 percent in 1993 to 38.6 percent in 1995. Given the various shortcomings of the surveys-- which are discussed below--the increase in poverty is probably overstated.

While overall there was little change in mean household expenditure and poverty, there were big differences in the changes in mean expenditure and poverty across regions and socioeconomic groups. Within urban and rural areas there was no uniform trend: poverty increased most dramatically in Abidjan, but declined in Other Cities, while within the rural areas, poverty in the East Forest and the Savannah remained essentially unchanged, while poverty worsened significantly in the West Forest. However, first order dominance testing showed that the 1993 and 1995 "poverty incidence curves" (plot of headcount index of poverty on the vertical axis and the poverty line on the horizontal axis) for Other Cities, East Forest, and the Savannah intersect each other repeatedly within the range of 50,000 to 100,000. This CFAF (in 1985 CFAF) indicates that the poverty ranking of the two years is sensitive to the choice of poverty line.

Looking at households classified by the socioeconomic group of the household head --which does not necessarily indicate what the major source of income of the household is[19]--we find, not too surprisingly, that poverty increased among food crop farmers (table 16). However, poverty also increased slightly among export crop farmers, contrary to our expectations, given the increase in real producer prices. This is primarily due to the large increase in poverty among export crop farmers in the

[19] The definition of socioeconomic groups was based first of all on the declared occupation and sector of activity of the household head. Households whose heads, for example, declared themselves to be farmers where then classified into export or food crop households on the basis of whether or not their export crop revenue was at least 50 percent greater than the revenue from marketed sales of food crops. Public sector employee households were classified on the basis of the principal activity of the household head. The definitions used in 1993 and 1995 are not strictly comparable to those used in 1985-1988, which did take into account sources of income.

West Forest, which more than offset the decline in poverty among export crop farmers in the Savannah (table 17).[20] The large increase in poverty among export crop farmers in West Forest is puzzling, and is considered below in more detail. The reduction in poverty was greater among export crop farmers whose major source of export crop revenue is coffee than among those who depend most heavily on cocoa, as expected.

Table 16: Headcount Index of Poverty by Socioeconomic Group

(Poverty Line=75,000 CFAF per year in 1995 CFAF)

	Headcount Index		*Weighted population*	
Socioeconomic Group	*1993*	*1995*	*1993*	*1995*
Export crop farm	0.394	0.432	16576	1582
Food crop farmer	0.492	0.584	13507	1149
Agriculture worker	0.531	0.364	843	237
Public sector employee	0.076	0.140	6062	446
Private formal sector employee	0.071	0.075	4137	431
Private informal employee	0.254	0.310	2464	976
Self-employed formal sector	0.078		125	
Self-employed informal sector	0.248	0.293	8229	267
Unemployed	0.202	0.528	661	60
Inactive	0.271	0.191	4096	312

Table 17 Household Expenditure Per Capita and Headcount Index of Poverty Among Farm Households

	East Forest		*West Forest*		*Savannah*	
	1993	*1995*	*1993*	*1995*	*1993*	*1995*
Expenditure per capita (in 1985 CFAF per year)						
Export crop farmer	96768	99169	110082	94840	82372	89929
Food crop farmer	98157	83564	92117	90038	81088	87115
Headcount index						
Export crop farmer	0.407	0.406	0.340	0.515	0.524	0.406
Food crop farmer	0.414	0.567	0.503	0.594	0.532	0.577

Poverty decreased among agricultural workers, though in view of the small sample size the difference may not be judged significant. However, there are some reports that labor has become more difficult to mobilize in rural areas, and that after the devaluation there was a sharp increase in labor demand primarily for weeding coffee. One publication, based on evidence from a few villages, reported that nominal wages had increased by 60 percent which would imply a significant real wage increase on the order of about 20 percent in early 1995, greater than the real increase in cocoa prices, though less than the real coffee price increase.[21] If indeed agricultural workers did benefit from wage increases of

[20] Poverty also declined among export crop farmers in Other Cities, but they accounted for only 5 percent of the export farmer population in 1995.

[21] Wages increased by 60 percent in the villages of Gobarza and Kremouyé post devaluation (Pallix, 1995). The precise date was not specified.

this magnitude, the dramatic reduction in poverty would be understandable. Given the increase in poverty in urban areas, and return migration from the urban areas to the countryside, the labor constraints may slacken and real wages fall over the next few years. However, one should be careful in interpreting the results of the socioeconomic breakdown in the survey data, as we do not know what percentage of household income is made up of wage labor, and whether wage incomes increased in the households classified as wage laborers. Moreover, given the various categories of hired labor that exist, it is not clear that the surveys do an adequate job of identifying all the various forms of hired labor and coding them correctly. So it is entirely possible that the observed decline in poverty in this group of households may have little or nothing to do with labor earnings per se.

There was a substantial increase in poverty among public sector employees, as expected given that real public sector wage bill declined in real terms. Following the devaluation in January 1994, the government granted a 10 percent increase in wages and salaries across the board, although fringe benefits remained unchanged. Thus, the overall increase in personnel remuneration amounted to about 8 percent. The number of employees remained essentially unchanged. The rate of inflation between the two surveys was 48 percent for Abidjan (the pre-devaluation survey was conducted April-May 1992) and 43 percent for the rest of the country (the pre-devaluation survey was conducted between June-November 1993). Thus remuneration of Abidjan civil servants fell by 27 percent in real terms, while remuneration of civil servants outside Abidjan fell by 24 percent. The survey data show that household expenditure per capita of Abidjan public employee households fell by 15 percent, while expenditure per capita of public sector employee households in Other Cities fell by 24 percent. Thus, it seems that public sector employee households in Abidjan were better placed to draw on other sources of income or savings to mitigate the decline in their public sector salaries than public sector employees outside Abidjan.

The outcome for the informal sector seems to be strongly influenced by the outcome of other segments of the local economy. The big difference between Abidjan and Other Cities is that poverty in the informal sector (i.e. employees in the informal sector or self-employed) in Abidjan showed a big increase, while in Other Cities it declined (table 18). Informal sector households in Other Cities may have benefited from higher derived demand from the rural areas and have more agricultural income. It is hard to draw firm conclusions about self-employed in rural areas, since the sample size of the rural self-employed in 1995 amounts to only 5 percent of the population; poverty declined among these households in West Forest and the Savannah, but increased in East Forest.

Table 18 Urban Headcount Index of Poverty by Major Socioeconomic Group
(Poverty Line = 75,000 CFAF per year in 1985 CFAF)

	Abidjan		*Other Cities*	
Socioeconomic Group	*1993*	*1995*	*1993*	*1995*
Public sector employee	0.002	0.065	0.140	0.274
Private sector formal employee	0.049	0.055	0.128	0.188
Informal sector	0.058	0.291	0.338	0.278

Factors Affecting the Credibility of the 1993-1995 Results

There are a number of problems associated with the 1993 and 1995 survey data, including sampling problems in 1993, the small sample size in 1995, the estimation of housing expenditure, the limited time period of the year during which the survey was conducted, the problem in correctly coding the consumption of home production data in 1993, the method used to estimate purchased food expenditure, and the non-representativeness of the consumer price index. In many cases the biases appear to be in the direction of overestimating the incidence of poverty in 1995.

Survey design and implementation

A major difference between the 1993 and 1995 priority surveys is the size of the sample. The 1993 survey is based on a sample of 9,600 households, while the 1995 sample of 1,000 households is a little more than a tenth the size. The size of the some of the cells is very small in 1995, thus restricting the analysis one can do. Second, the 1993 sampling procedure was based on a household listing done in 1991. Surveying of the households began in March 1992, almost exclusively in Abidjan, but it was interrupted a few months later due to lack of money. Surveying resumed in June 1993 and was completed in November 1993. On average 22 months passed between the household listing and survey. A problem arose that many of the households that were listed in 1991 were not relocated in 1993. In urban areas, about 50 percent of the households selected were not surveyed, mostly because they could not be located, while in rural areas about a third of the households were not surveyed. Thus, the more stable households are over-represented in the sample, while the least stable-- and perhaps the poorest-- are underrepresented. However, because of the high replacement rate in Abidjan, INS decided to keep the 1680 households in Abidjan that had been surveyed in 1992 as part of the sample, and to reject those that had been surveyed in 1993. Presumably, therefore, the Abidjan sample suffers less from this bias.

Another worrisome finding is the relatively large number of households in the 1993 survey that reported zero value for the sum of purchased expenditure and imputed value of consumption of home production (Appendix C). About one percent of households fall in this category. Some of these households did report receiving transfers of food from people outside the household, but is unlikely that transfers from outside the household would be the sole source of food. The relatively large number of households with zero food expenditure suggests that there may been problems with implementation of the survey or with data entry.

Decline in household size

A troubling finding is the decline in household size between 1993 and 1995 (table 19). This would tend to raise per capita expenditure, all other things being equal, assuming that per capita household expenditure and household size are inversely correlated as is usually the case. Mean household size fell from 5.9 persons in 1993 to 5.5 persons in 1995, with the fall particularly acute in the West Forest. For Côte d'Ivoire as the whole, the 1993 estimate is not too dissimilar to the 1988 estimate of 6.2 persons. For export crop farmers, the 1988 estimate was 6.8, compared to the 1993 estimate of 6.7 and the 1995 estimate of 5.9 persons (table 20). The fall in household size is particularly large among export crop farmers who grow cocoa: household size declined from 7.1 to 5.9 persons between 1993 and 1995 (table 21). In contrast, food crop farmer household size did not decrease: mean household size rose slightly from 5.5 to 5.7 persons. Both estimates are somewhat lower than the 1988 estimate of 6.4 persons. Unfortunately without another source of information it is impossible to determine whether the fall in household size is a real phenomenon, unlikely as that is. Since the 1993 and 1988 household size estimates are reasonably close, it is more likely that decline in

household size reflects problems with the 1995 sampling design or administration of the questions regarding household membership.

Table 19 Mean Household Size by Region

	Household size			
Region	*1985*	*1988*	*1993*	*1995*
Abidjan	6.18	5.88	5.98	5.82
Other Cities	6.41	6.33	6.19	5.27
East Forest	6.60	6.46	6.14	5.86
West Forest	6.03	5.60	5.68	4.63
Savannah	7.24	6.35	5.47	5.57
Côte d'Ivoire	6.51	6.16	5.91	5.46

Source: 1985 and 1988: Demery and Grootaert (1993); 1993 and 1995: Priority Surveys.

Table 20 Mean Size of Farm Households

	Household size			
Region	*1985*	*1988*	*1993*	*1995*
East Forest				
Export crop farmer			7.38	6.23
Food crop farmer			5.51	6.09
West Forest				
Export crop farmer			6.34	5.30
Food crop farmer			4.77	4.15
Savannah				
Export crop farm			6.06	5.75
Food crop farmer			5.50	6.10
Côte d'Ivoire				
Export crop farm	6.92	6.70	6.70	5.86
Food crop farmer	7.06	6.38	5.47	5.66

Source: 1985 and 1988: Demery and Grootaert (1993); 1993 and 1995: Priority Surveys.

Table 21 Mean Size of Cocoa- Growing Export Farmer Households

	Household size	
Region	*1993*	*1995*
East Forest	7.49	6.10
West Forest	6.65	5.38
Savannah	7.16	6.25
Côte d'Ivoire	7.09	5.92

Incorrect coding of the consumption of home production data

In the process of working with the 1993 data, we discovered that the data, as it was originally processed, showed a dramatic decline in consumption of home production. The reason was that in 98 percent of the 25,570 cases, the number of months of consumption of home production were coded as one month, in contrast to 2 percent of the cases in the 1995 survey (table 22). In examining a few questionnaires it was evident that the data for the number of months of consumption of home-produced items had been incorrectly entered on the computer file. Unfortunately, INS was not able to reenter the data for 1993.

Table 22 Côte d'Ivoire: Number of Months of Consumption of Home Production 1993 and 1995

Reported Months	*Unrevised 1993 survey*		*1993 corrected survey*		*1995*	
of Consumption	*Frequency*	*Percent*	*Frequency*	*Percent*	*Frequency*	*Percent*
1	25107	98.3	320	1.3	57	1.9
2	1	0.0	774	3.0	169	5.6
3			1110	4.3	184	6.1
4			1076	4.2	185	6.1
5	4	0.0	752	2.9	123	4.1
6	2	0.0	1696	6.6	285	9.5
7			532	2.1	82	2.7
8			886	3.5	128	4.2
9			322	1.3	61	2.0
10	124	0.5	3442	13.5	117	3.9
11	288	1.1	175	0.7	11	0.4
12	3	0.0	14444	56.6	1612	53.5

Fortunately, however, a mistake was made in filling out the questionnaires that allowed us to make a first-order correction. Even in cases where households had purchased none of a particular food item that they produced at home, they still filled out the number of months of consumption question under the entry for the number of months a purchased good was consumed. In the small number of original questionnaires that we were able to examine, the number of months of purchased consumption corresponded in most cases to the number of months of consumption of home production. Hence we used the number of months of purchased consumption (in the case where no purchased value was declared) to correct what was assumed to be the incorrectly coded number months of consumption of home production (almost always one month). Other procedures were used to correct the cases where purchased food value was nonzero. These are described in more detail in Appendix C.

Once the corrections were made, the frequency of months of consumption between 1993 and 1995 are fairly similar, though there is a higher frequency of 10 months of home consumption in 1993 data compared to the 1995 data (table 22). The mean number of months in the corrected 1993 sample is 9.7, compared to 8.9 in 1995. Whether this difference is a result of the cleaning procedure or reflects actual reported consumption patterns cannot be ascertained. However, it does suggest that there may be some upward bias in the 1993 consumption of home production and thus that it would be desirable to re-enter the incorrectly entered 1993 data, rather than rely on the imputed number of months.

Housing expenditure

Housing expenditures. In the Côte d'Ivoire surveys, as in other surveys, statistical techniques are used to impute housing expenditures for the households that do not pay rent. Using the sample of households that do pay rent, regression analysis was used to estimate a hedonic rental equations relating the amount of rent paid to different household characteristics, with regional dummy variables added to capture spatial variation in rental prices. The small sample size was a problem in 1995; only 9 households in West Forest and 12 households in the Savannah rented lodging in 1995.[22]

In the initial processing of the data, housing expenditures were estimated separated for the 1993 and 1995 using different specifications of the hedonic rental equation. Real housing expenditures increased substantially in rural areas. The increase in the Savannah of 47 percent was particularly suspect. There is little reason to think the imputed value of housing would have increased significantly, especially since the housing costs rose less rapidly than other goods after the devaluation.

Another approach to deriving imputed housing costs is to pool the 1993 and 1995 data and use the same equation to estimate housing costs, with dummy variables for each region allowed to vary between 1993 and 1995. This improves comparability but does not eliminate entirely the problem caused by the small sample size in 1995. With the pooled sample, real housing expenditures fall in all regions but the Savannah, where they remain unchanged. The two methods yield different estimations of the headcount index of poverty in 1995 (table 23). While recognizing that housing expenditures in the Savannah may be overestimated even with the pooled estimate, it is the better of the two estimates.

Table 23 Headcount Index of Poverty Using Different Estimates of Housing Expenditure
(poverty line = 75,000 CFAF in 1985 CFAF)

	Separate Equations for 1993 and 1995		*Pooled Equation for 1993 and 1995*	
	1993	*1995*	*1993*	*1995*
Abidjan	.048	.183	.051	.202
Other Cities	.313	.285	.312	.286
East Forest	.373	.396	.389	.410
West Forest	.356	.460	.382	.501
Savannah	.485	.417	.494	.494
All	.313	.339	.323	.386

[22] See Appendix A for a discussion of the estimation of housing expenditure.

Seasonality

The 1993 and 1995 surveys were conducted only over a period of several months: June to November 1993 and April and May 1995. Households were interviewed once during that period, and were asked about expenditures over the past week, month, three months or year depending on the category of expenditure. If either of these surveys were conducted during periods of exceptionally low or high expenditure, then the estimates of mean expenditure and the poverty incidence calculations could be biased. To assess whether there is a bias, we need some way of determining how expenditure varies over the year and correcting for seasonal fluctuations. Fortunately the 1985-1988 CILSS surveys can be used for this purpose.

Households in the CILSS surveys were interviewed once about their expenditures, with the interviews conducted randomly throughout the year. Since the CILSS surveys had a two week recall period for both purchased food and many nonfood items, a high percentage of expenditure would potentially be subject to seasonal variation. This variation in expenditure could arise from seasonal fluctuations prices, particularly food prices, that are not offset by variations in quantity, or to seasonal variation in income, to the extent that households do not smooth their consumption over the course of a year. There could also be seasonal variation present in the estimate of expenditure on items for which the recall period was a year if the period of the year during which the interview takes place influences the size of the recall error. For example, households interviewed during a period in which they typically purchase more durable goods, send more remittances, or consume more home production might remember more of their expenditures than households interviewed during other periods of the year. Or the value households attach to the consumption of home production may vary with the market price of the home-consumed product. Or the estimate of the quantity consumed each day or the number of days per month a home-produced good is consumed may reflect the pattern during the month that household is interviewed rather than the average over the year.[23] Thus any seasonal variation evident in the surveys could reflect genuine seasonal variation in expenditure as well as systematic seasonal recall biases.

To assess the extent of seasonal variation, we regressed the log of household expenditure on dummy variables for the season during which the household was interviewed as well as on a set of variables included to control for possible non-randomness in the distribution of households across months of the year, including household size, the square of household size, and dummy variables for education levels. To determine whether there were region-specific seasonal interactions, a set of regional dummies was then interacted with dummy variables for three time periods during year: April/May, correspondingly to the 1995 survey; June-November, corresponding to the 1993 survey, and December-March, the remaining months. Imposing the restriction that the sum of the three time period

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[23] To examine whether there was any seasonality present in the annual estimate of consumption of home production, we regressed the annual estimate of consumption of home production (for those households reporting positive home consumption) on the region and crop dummy variables interacted with the time period variables. The June-November time period was split into two sub-periods: June-August, and September -November, corresponding more closely to the pre and post-harvest periods. In the regression over the sample of households with expenditures less than or equal to 100,000 CFAF per capita, only the East Forest*June-August dummy is significant at the 5 percent level, indicating that expenditures among East Forest non export crop farmers are significantly lower than the December-March period. Over the much larger sample of households whose expenditure exceeds 100,000 CFAF per capita, the Other Cities, East Forest, West Forest and Savannah June-August dummies are significant and negative. This suggests that the time of the year during which the interview biases the estimate of consumption of home production.

dummies for each region add up to zero allows a unique set of regression coefficients to be estimated. The coefficients of the regional dummy variables interacted with the time period dummies (referred to as the regional*time period dummies) can then be interpreted as the deviation from average expenditure in that region over the year (Suits, 1984) over the average of all other variables.[24] Since we suspected that cash crop income might also have an effect on seasonal spending patterns, we included a dummy for whether a household was a cotton farmer and a dummy for whether a household farmed cocoa and/or coffee. These crop dummies were interacted with the time period dummies. Since households with a high ratio of home consumption might also show different patterns of seasonality, we also added a dummy variable for households whose home consumption was greater or equal to 0.6 of purchased consumption, and interacted the home consumption dummy with the time period dummies.

We also suspected that households at different levels of expenditure might exhibit different seasonal patterns. To allow for this possibility, we stratified the 1985-1988 sample into two sub-samples: households with expenditures of less than 100,000 CFAF per capita and those with expenditure greater than 100,000 CFA. Stratifying the sample at levels less than 100,000 CFAF per capita yielded too few observations for the months of March and April. And since our interest for the poverty profile is the seasonal correction for expenditures in the range of 75,000 CFAF, we wanted to pick a relatively low level of household expenditure as the cut-off point.

The regression analysis did reveal some seasonality (table 24). For nonexport-crop-growing households with a low ratio of consumption of home production to purchased food (the defaults), households interviewed in the June-November period in Other Cities had significantly lower expenditures, as did households interviewed in the December-March period in West Forest. In general, however, seasonality was not pronounced in the nonexport crop-growing households in the rural regions with low ratio of home-produced to purchased food expenditure. As might be expected, cocoa/coffee- and cotton-growing households interviewed in the December-March period when the crop is marketed (with low ratios of home produced to purchased food expenditure) had significantly higher levels of total expenditure. And among non-export crop-producing households with a high share of home produced to purchased food expenditure, expenditures were higher in households interviewed in the April-May period and lower in those interviewed in the December-March period.

The major difference between the two income groups in the pattern of seasonality, aside from Abidjan, which is discussed below, is the case of cotton farmers. The expenditure of poor cotton farmers shows more pronounced seasonality than better off cotton farmers. Expenditure is highest among poor cotton farmers interviewed in December-March, and then falls off precipitously in the April-May period. For better off cotton farmers, expenditure is lower among households interviewed in the June-November period. These results suggest that better off cotton farmers may either have

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[24] Suits' (1984) procedure imposes the restriction that the unweighted sum of the coefficients of each set of dummy variables sums to zero. Rather than using the unweighted sum, however, we restricted the weighted sum to equal zero. In the case of the regional*time period dummy coefficients, the weights are the mean value of regional*time dummy variables, divided by the mean value of the regional dummy variable. The weights sum to one.

Table 24 Regression of the Logarithm of Household Expenditure per Capita *(t-statistics in parentheses)*

Dummy variables[a]	*Household expenditure per capita ≤ 100,000 CFAF*			*Household expenditure per capita ≥ 100,000 CFAF*		
	April-May	*June-November*	*December-March*	*April-May*	*June-November*	*December-March*
Abidjan	0.144	-0.022	-0.044	-0.043	-0.005	0.041
	(1.377)	(-0.730)	(-0.433)	(-1.867)	(-0.455)	(2.191)
Other Cities	-0.042	-0.020	0.073	0.072	-0.020	0.013
	(-0.618)	(-1.333)	(1.876)	(2.466)	(-2.289)	(0.578)
East Forest	-0.072	0.024	-0.001	-0.034	0.025	-0.026
	(-1.433)	(1.128)	(-0.036)	(-0.797)	(1.536)	(-1.017)
West Forest	0.009	0.048	-0.080	-0.021	0.000	0.015
	(0.106)	(1.493)	(1.686)	(-0.474)	(0.019)	(0.470)
Savannah	-0.001	0.025	-0.029	-0.019	-0.003	0.010
	(-0.024)	(0.928)	(-0.906)	(-0.450)	(-0.148)	(0.444)
Cotton	-0.169	-0.014	0.119	0.022	-0.042	0.057
	(-2.975)	(-0.436)	(3.143)	(0.586)	(-2.610)	(2.323)
Coffee/Cocoa	-0.024	-0.034	0.071	0.022	-0.042	0.057
	(-0.440)	(-1.610)	(2.135)	(0.586)	(-2.610)	(2.323)
High consumption of home production[b]	0.071	0.006	-0.046	0.043	-0.006	-0.009
	(1.693)	(0.313)	(1.674)	(1.170)	(-0.399)	(-0.411)
R^2		0.7420			0.6660	
N		1160			5173	

[a] Dummy variables shown in this table are interacted with the dummy for the specified time period in the table.

[b] Defined as the ratio of consumption of home production to production to purchased food ≥ 0.6.

more capacity to smooth expenditure or that cotton income is a smaller share of total income and therefore does not distort expenditure patterns as much as it does for poor cotton farmers. In contrast there is very little difference in the seasonality pattern for coffee/cocoa farmers, somewhat surprisingly.

To de-seasonalize the 1993 and 1995 expenditure estimates, we subtracted the relevant dummy variables from the log of each household expenditure for each household in the 1993 and 1995 surveys. For the 1993 survey, we used the June-November time period dummies interacted with the region, crop, and home consumption dummies, whereas for the 1995 survey we used the April -May dummies interacted with the region, crop, and home consumption dummies. No seasonal correction was made to the Abidjan observations, since only 8 households with expenditures of 100,000 CFAF or less were interviewed in March-April in the 1985-1988 surveys.[25]

The poverty profile, corrected for the seasonal bias, is presented in table 25. The only region in which there is a reversal of trend is in East Forest, where poverty falls instead of rises. However, neither the magnitude of the difference between the 1993 and 1995 original estimates nor the difference between the seasonally corrected estimates is large for East Forest, as well as for Savannah and Other Cities. The big increase in poverty in West Forest remains even with the seasonal correction, and is investigated below. The reason that the poverty estimates change so little is that the relatively large changes for the cash-cropping households tend to be offset in part by the regional and home consumption dummies. Among the major socioeconomic groups in each region, the seasonally adjusted poverty figures show that poverty falls slightly among export crop farmers in East Forest, and drops more significantly among export crop farmers (primarily cotton farmers) in the Savannah (table 26).

Table 25 Headcount Index of Poverty Corrected for Seasonal Variation
(Poverty line = 75,000 CFAF per year in 1985 CFAF)

	Seasonally unadjusted		*Seasonally adjusted*	
Region	*1993*	*1995*	*1993*	*1995*
Abidjan	.051	.202	.051	.202
Other Cities	.312	.286	.293	.275
East Forest	.389	.410	.392	.383
West Forest	.382	.501	.393	.532
Savannah	.494	.494	.510	.509
Côte d'Ivoire	.323	.368	.323	.367

[25] The Abidjan*April-May dummy regression coefficient indicates that expenditures are 14 percent higher for households interviewed during this period, but the coefficient is not significant at even the 10 percent level. For the sample of households of expenditure exceeding 100,000 CFA per capita, the coefficient for Abidjan*April-May dummy showed that expenditures of households interviewed in this period are about 4 percent lower than average (significant at the ten percent level). In any event, since the Abidjan households were interviewed in the same period for both the 1993 and 1995 surveys, any seasonal correction would alter the poverty estimates in the same direction.

Table 26 Headcount Index of Poverty Among Farmers, Corrected for Seasonal Variation *(Poverty line = 75,000 CFAF per year in 1985 CFAF)*

	Seasonally unadjusted		*Seasonally adjusted*	
Region	*1993*	*1995*	*1993*	*1995*
Other Cities				
Export crop farmer	0.334	0.071	0.296	0.071
Food crop farmer	0.540	0.645	0.523	0.645
East Forest				
Export crop farmer	0.407	0.406	0.400	0.363
Food crop farmer	0.414	0.567	0.429	0.557
West Forest				
Export crop farmer	0.340	0.515	0.352	0.561
Food crop	0.503	0.594	0.516	0.604
Savannah				
Export crop farmer	0.524	0.406	0.531	0.406
Food crop farmer	0.532	0.577	0.552	0.603

One problem in using the coefficients derived from the 1985 -1988 LSMS data to correct the 1993 and 1995 surveys is that the total expenditure aggregate for many food and some nonfood items is based on the average of the two week (annualized by multiplying by 26 weeks) and the normative estimate of monthly food expenditure multiplied by typical number of months of purchase. Unless there is seasonal recall bias, one would expect that there would be no seasonal variation in the normative estimate. Thus, the average of the two estimates would exhibit less seasonal variation and could result in a downward bias in the seasonal correction parameters.

One way of assessing the possible extent of this bias is to compare the difference in the seasonal variation in the two different estimates of food expenditure. One estimate is based on the two week recall, while the other is average of the two week and the normative estimates. The June-November time period was split into two sub-periods: June-August, and September-November, corresponding more closely to the pre and post-harvest periods, which may have some bearing on the seasonality in food purchase. With a few exceptions, the coefficients are generally of the same magnitude. The averaged estimate does not appear exhibit less pronounced seasonal variation than the two week estimate alone (table 27). This suggests that there may also be some seasonal bias in the annual recall estimate of food expenditure in the same direction as the two week estimate. We opted to use the average of the two week-annualized estimate and the normative estimate as the dependent variable in the regressions used to produce the seasonal adjustment variable, as the expenditure aggregate was the only cleaned expenditure aggregate variable available to us in the 1985-1988 data file.

Table 27 Regression of the Logarithm of Purchased Food *(t - statistics in parentheses)*

	April - May		*June - August*		*September - November*	
Dummy variables	*≤ 100,000*	*≥ 100,000*	*≤ 100,000*	*≥ 100,000*	*≤ 100,000*	*≥ 100,000*
Two week/normative average						
Abidjan	0.100	0.056	-0.029	-0.002	0.030	-0.032
	(0.282)	(-1.108)	(-1.113)	(-0.049)	(0.199)	(-0.662)
Other Cities	-0.111	-0.024	0.030	-0.034	-0.046	-0.047
	(-.500)	(-0.394)	(0.199)	(-0.692)	(-0.298)	(-0.945)
East Forest	-0.303	-0.164	0.216	0.072	-0.017	0.235
	(-1.803)	(-2.038)	(1.381)	(1.062)	(-0.016)	(3.639)
West Forest	-0.088	-0.078	0.639	0.044	0.151	0.008
	(-0.314)	(0.854)	(2.883)	(0.563)	(0.664)	(0.094)
Savannah	0.152	0.149	0.383	0.227	-0.230	-0.299
	(0.916)	(1.890)	(2.513)	(3.518)	(-1.535)	(-4.369)
Coffee/cocoa farmer	0.142	0.088	-0.343	-0.211	-0.371	-0.348
	(0.763)	(1.145)	(-2.196)	(-3.318)	(-2.294)	(-5.491)
Cotton farmer	-0.495	-0.483	-0.909	-0.295	-0.013	0.000
	(-2.306)	(-3.581)	(-4.748)	(-3.080)	(-0.061)	(0.002)
Two week estimate of purchased food						
Abidjan	0.245	-0.052	.0210	0.014	-0.077	-0.034
	(0.608)	(-0.871)	(0.709)	(0.264)	(-0.306)	(-0.587)
Other Cities	0.077	-0.028	-0.011	-0.072	-0.064	-0.028
	(0.306	(-0.387)	(-0.007)	(-1.260)	(-0.359)	(0.488)
East Forest	-0.252	-0.133	0.057	0.073	0.094	0.229
	(-1.321)	(-1.404)	(0.319)	(0.916)	(-0.547)	(3.012)
West Forest	-0.340	-0.083	0.393	0.062	-0.036	-0.072
	(-1.063)	(-0.772)	(1.556)	(0.679)	(-0.139)	(-0.707)
Savannah	0.299	-0.262	0.330	0.263	-0.214	-0.378
	(1.530)	(2.837)	(1.893)	(3.463)	(-1.240)	(-4.709)
Coffee/cocoa farmer	0.101	0.060	-0.249	-0.215	-0.320	-0.358
	(0.477)	(0.672)	(-1.399)	(2.871)	(-1.717)	(-4.815)
Cotton farmer	-0.817	-0.451	-0.919	-.0387	-0.001	-0.010
	(3.340)	(-2.850)	(-4.208)	(-3.435)	(-0.003)	(-0.063)

Comparability in the method of estimating purchased food expenditure

Both the 1993 and 1995 surveys use the same method of estimating food expenditure, which essentially involves multiplying the estimate of purchases made over the last month for each month by the number of months the commodity is declared to be purchased. The drawback of this method is that it underestimates annual food purchases for the sample as a whole, since it makes no correction for the households that did not purchase the commodity in the previous month, but do purchase it during other months of the year. Typically surveys deal with this problem by multiplying purchases made during the previous month by 12 months, rather than by the declared number of months. Multiplying by 12 months yields a correct sample mean under various assumptions (see Appendix B). When the survey is not conducted over the course of the year, and there is a variation across the months of the year in the number of households reporting zero purchases the last month, the procedure of multiplying by 12 will not necessarily yield the mean-preserving result. However, it may still be a better estimate than the one produced by multiplying by the declared number of months.

We re-estimated purchased food expenditures by multiplying by 12 months instead of multiplying by the declared number of months, recomputed total household expenditure, and applied the seasonal correction parameters as described in the section above to the total expenditure aggregate. Because in 1995 food expenditures are much higher using the annualized rather than declared months method, poverty estimates are correspondingly lower in 1995 and thus the increase in poverty between 1993 and 1995 smaller (table 28). The difference between the annualized and the declared months method is particularly large in the case of East Forest and the Savannah, because of the large number of observations from households that do not purchase food during the entire year.

Table 28 Comparison of the Seasonally Adjusted Headcount Index of Poverty Based on the Annualized Monthly and the Declared Months * Monthly Value Estimates of Purchased Food Expenditure for 1993 and 1995

	Headcount Index of Poverty			
	Annualized monthly purchased food expenditure estimate		*Declared months * monthly value purchased food expenditure estimate*	
Region	*1993*	*1995*	*1993*	*1995*
Abidjan	.040	.192	.051	.202
Other Cities	.291	.249	.293	.275
East Forest	.376	.307	.392	.383
West Forest	.390	.503	.393	.532
Savannah	.506	.432	.510	.509
Côte d'Ivoire	.316	.323	.323	.367

The decision about which aggregate to use for estimating purchased food expenditures in 1993 and 1995 is not clear-cut, however. If, for example, for seasonal or other reasons, the percentage of households with zero purchases the previous month but positive purchases at some point during the year is less that what would be expected given the average number of months of reported expenditure (assuming no recall bias), then the annualized method would overestimate expenditure. Appendix B describes some of the drawbacks of the two methods.

This paper maintains the purchased food expenditure aggregate as calculated in the INS file, with the proviso that it may lead to a downward bias in the expenditure data for 1995. It should be noted, however, that some of the puzzling trends noted in the next section of the paper (e.g. the large increase in poverty among West Forest export crop farmers, the larger growth in household expenditure among Savannah farmers relative to East Forest farmers) persist even if the 12 month estimate of purchased food expenditure is used in calculating total household expenditure.

Shortcomings of the CPI

Published CPI information is available for three categories of households (blue-collar workers, white collar workers managers, and European-type consumption) in Abidjan. The expenditure shares are based on a 1976 consumption survey, while base prices currently in use are the mean November 1992-October 1993 prices. Prior to 1993, the CPI was based on the August 1984 to July 1985 prices. In addition in 1993, the INS shifted to actually purchasing goods at the market. So there may be some problem of comparability between the pre- and post-1993 consumer price indices. The major shortcomings of the deflators used to calculate real household expenditure and thus the poverty indicators are (1) the difference between the expenditure shares used to construct the CPI and the survey shares and (2) the absence of regional price indices. The large differences in expenditure patterns across the country illustrate the need for region-specific CPIs based on actual expenditure patterns and price increases.

There is a large difference in the expenditure shares on which the CPI is based and those derived from the surveys. Table 29 compares the consumption weights in the CPI basket for blue-collar Abidjan workers with the expenditure shares derived for Abidjan poor and non-poor households. The major difference is poor households spend a much greater proportion of their expenditure on housing and utilities than is indicated by the CPI basket. Even in non-poor Abidjan households the share of expenditure on housing and utilities as revealed by the survey exceeds the share in the CPI basket. Moreover, the difference is actually understated, since remittances are part of the survey consumption basket, but not part of the CPI. If remittances were eliminated from the survey consumption basket, the survey share of expenditure on housing would be even greater.

Since lodging and utilities had the lowest rates of inflation of any category in the CPI between December 1993 and March 1995 (table 30), a higher share of expenditure allocated to housing and utilities would result in a lower inflation rate, and thus in higher real per capita expenditures on 1995. As a rough indication of how the inflation rate would change if one were to use the survey consumption weights base, mean expenditure per capita on average would be about 2 percent higher using the survey expenditure shares.[26] However, this calculation abstracts from the fact that the composition within the various groups of expenditure may differ significantly between the CPI and the household surveys, as the discussion of the composition of the food subcomponent, below, illustrates.

A second shortcoming of the INS CPI series is that there is no CPI series for the rural areas. To deflate expenditures in the household surveys, INS constructed a deflator for each region for 1985 based on price differentials calculated from the International Comparison of Prices survey data (Grootaert and Kanbur, 1994). The price deflator for Abidjan was used to construct the price series

[26] We assume that the inflation rates for the categories in the remittances, non-food in kind and education in the survey is equal to the weighted inflation rate of the other categories. This calculation is based on the December 1993 and March 1994 CPI inflation rates.

Table 29 Composition of Expenditure *(percent)*

Expenditure Categories	*CPI basket Abidjan blue collar worker households*	*1993 Priority survey results*					
		Abidjan poor	*Abidjan non- poor*	*Abidjan*	*Savannah*	*Côte d'Ivoire poor*	*Côte d'Ivoire non- poor*
Food	48.0	44.7	34.7	34.8	6.1	56.8	46.0
Lodging and utilities	16.3	27.8	20.0	20.1	16.2	21.4	17.9
Clothing	10.1	5.4	6.3	6.3	6.1	6.8	6.7
Transport	12.2	5.6	12.5	12.4	3.3	2.8	7.7
Household maintenance	4.0	0.9	2.0	1.6	1.2	1.1	1.6
Hygiene	1.0	2.5	2.0	2.0	2.1	2.4	2.1
Health	0.7	5.4	6.7	6.7	1.3	2.3	5.0
Education	1.0	4.0	5.0	5.0	0.9	1.9	3.5
Miscellaneous	6.7	0.6	1.1	1.1	1.0	0.7	1.1
Remittances sent		3.0	9.7	9.6	5.2	3.6	8.3
Non-food in kind receipts		0.1	0.1	0.3	0.4	0.3	0.2

Table 30 Consumer Price Index Blue - Collar Worker
(November 1992 - October 1993 = 100)

Expenditure Categories	*December 1993*	*March 1995*	*December 1995*
Food	100.3	144.8	142.3
Lodging	100.0	114.7	114.7
Utilities	104.7	119.4	129.2
Furnishing	103.0	166.4	161.6
Clothing	100.0	168.3	167.9
Transport	100.0	138.4	138.4
Vehicles	108.0	141.9	141.9
Household Maintenance	100.3	131.7	131.2
Hygiene	100.1	149.2	156.3
Health	101.4	147.3	154.9
Miscellaneous	104.6	172.9	171.9
Total	101.4	145.0	144.4

over time for each region. Other countries, such as Ghana, have a rural price index available. The urban and rural deflators for the Ghana poverty analysis are based on rural and urban price indices. Given the difference in expenditure shares between the survey and CPI baskets in Ghana, the food and nonfood price indices were weighted by the survey shares to derive the deflators. Such a procedure might be envisioned for Côte d'Ivoire, though in the absence of regional price indices over time and given the differences even in the composition of food expenditure between the survey and the CPI basket, it is not clear that the result would necessarily be more accurate.

The use of the Abidjan price deflator as the price deflator for other regions could potentially be a problem, since there is a big difference between Abidjan and the Savannah in the share of expenditure on food. The food share is 62 percent in the Savannah compared with 35 percent in Abidjan, according to the 1993 survey (table 31). The higher share on food in the Savannah was offset by a somewhat lower share of expenditure on lodging and utilities, health and education, transport and remittances. Since the price increase in lodging and utilities was far less than the overall increase in prices, this would have contributed to the Savannah having a slightly higher rate of inflation than Abidjan, if the price index were recalculated on the basis of the Savannah consumption basket.

Table 31 Share of Staple Foods in Household Expenditure Based on the 1993 Survey Results

Expenditure Categories	*Share of maize, millet, manioc and yams in food expenditure*	*Share of rice and plantain in food expenditure*	*Food share in total expenditure*	*Share of maize, millet, manioc and yams in total expenditure*	*Share of rice and plantain in total expenditure*
Region					
Abidjan	12.0	20.1	34.8	4.2	7.0
Other Cities	18.4	33.6	43.9	8.1	2.7
East Forest	29.8	23.4	56.8	16.9	13.3
West Forest	28.7	33.5	59.9	17.2	10.3
Savannah	43.5	17.2	61.5	26.8	4.6
CPI					
Blue collar worker CPI	10.3	7.2	48.0	4.9	8.3
White collar worker CPI	6.8	15.5	38.8	2.6	6.0

Offsetting this difference, however, is the difference in the composition of food expenditure between Abidjan and the Savannah. Twenty-seven percent of total expenditure in the Savannah was on the four main staples whose prices went down in real terms between 1993 and 1995, compared to 4 percent in Abidjan, and 5 percent in the CPI blue collar basket (table 31). Thus, most of the 27 percentage point difference in the food shares between Savannah and Abidjan is for the four major staples foods whose real price fell between 1993 and 1995. This suggests that, in the Savannah, the price increase in food basket may not have kept up with the overall rate of inflation, and may have more than offset any other differences in the consumption basket, such as the lower expenditure share of lodging, that would tend to raise the Savannah's inflation rate above that of other regions. In any event, information on differences in expenditure shares would need to be complemented by information on region-specific changes in prices, which does not exist.

Another shortcoming is that the same price index is used for both poor and non-poor households, even though expenditure shares differ between the two group. Overall the poor spend 10.8 percentage points more on food, 3.5 percentage points more on lodging and utilities, and substantially less on education, health, transport, and remittances (table 29). About half of the difference on food spending is for the four staple food items. Assuming that the rate of inflation of education, health, transport, and remittances is roughly the same as the overall rate of inflation, then the inflation rate for the poor, although they spend a higher proportion of their expenditure on food, would actually be lower than for the non-poor, taking into account the larger share of expenditure on staple food and lodging by the poor. Thus, the average inflation rate is likely to overstate the actual inflation rate for the poor, and understate it for the nonpoor. The result would be an apparent adverse redistribution effect, as the expenditure of the nonpoor would grow at a faster rate than mean per capita expenditure, while the expenditure of the poor would grow at a slower rate.[27]

[27] This abstracts from changes in expenditure shares that arise from substitution effects. If, for example, preferences of the non-poor were such that they substituted goods with the least price inflation for those with the highest, then their true cost of living index would show less inflation that the poor, all other things being equal. For a discussion of true cost of living indices for households of different standards of living, see Deaton (1980). For an empirical application to the problem of defining spatial cost-of-living differences, see Ravallion and van den Walle (1989).

A Closer Look at the Impact on the Devaluation on Farm Households

This section of the paper discusses the trends in rural poverty evidenced by the household data. On the one hand, the data raise questions about the reliability of the survey results. On the other hand, they also suggest that many rural farm households may not have benefited -- at least in the short term from the devaluation -- to the extent commonly supposed (Goreux, 1995) because of export taxes imposed at the time of the devaluation.

The large increase in poverty in West Forest seems to be driven by the large decrease in home consumption. Consumption of home-produced food fell by 13 percent in East Forest and by 20 percent in the Savannah, compared to the 40 percent fall in West Forest (table 32). Breaking it down further, the fall was about 21 percent for food crop farmers in the West Forest, compared to 33 percent in the East Forest and 17 percent in the Savannah. For export crop farmers, the fall in consumption of home production was 43 percent in the West Forest, compared to only 6 percent in East Forest, and 13 percent in the Savannah (table 33). Thus, the huge decline in consumption of home production, particularly among West Forest export crop farmers, raises questions. The estimation of Engel curves shows that food shares drop significantly in the West Forest between 1993 and 1995, and not in the other rural areas (table 34).[28] However, for West Forest, the dummy for 1995 becomes insignificant if a dummy is added for 1995 export crop farmers. The export crop-1995 dummy is significant and negative, indicating that in 1995, West Forest export crop farmers had significantly lower food shares than other West Forest residents.[29]

Table 32 Mean Household Expenditure Per Capita *(in 1985 CFAF per year)*

	1993				*1995*			
	Consumption of home production	*Purchased food*	*Non - food*	*Household expenditure*	*Consumption of home production*	*Purchased food*	*Non - food*	*Household expenditure*
Abidjan	142	78275	146857	225274	364	64081	121805	186251
Other Cities	5235	49835	70375	125445	3416	52931	62259	118605
East Forest	29102	28657	43908	101667	25328	31885	41055	98269
West Forest	43008	20480	42497	105986	25643	27008	43596	96247
Savannah	35814	17109	33117	86040	28680	27066	35494	91240
Côte d'Ivoire	21544	39773	67989	129306	16104	41709	63673	121486

[28] There is a significant, though much smaller drop, in food shares in Abidjan between 1993 and 1995.

[29] The decline in consumption of home production does not appear to be related to the procedure used to correct the months of home consumption in 1993. There is a decline in the home consumption of the major staple foods not only in the months of consumption, but also in the number of days per month of consumption and especially in the value per day.

Table 33 Household Expenditure Per Capita, 1993 and 1995 *(in 1985 CFAF per year)*

	1993			*1995*		
	Consumption of home products	*Purchased food*	*Total expenditure*	*Consumption of home products*	*Purchased food*	*Total expenditure*
East Forest						
Export crop farmers	32397	21420	96768	31066	27186	99169
Food crop farmers	32837	27998	98157	21905	30278	83564
West Forest						
Export crop farmers	48114	18864	110082	26419	21959	94840
Food crop farmers	40418	16233	92117	33089	22790	90038
Savannah						
Export crop farmers	39654	12096	82372	33986	19605	89929
Food crop farmers	38645	13305	81088	31354	23793	87115

Table 34 Regional Estimates for Food Expenditure Budget *(t-values in parentheses)*

Independent Variables	*Abidjan*	*Other Cities*	*East Forest*	*West Forest*	*Savannah*	*West Forest*
LOGHHEXP	-0.112	-0.110	0.020	0.0314	0.019	0.031
	(-36.368)	(34.899)	(-4.037)	(5.686)	(3.623)	(3.553)
LOGHHSZ	0.061	0.051	0.037	0.097	0.083	0.098
	(5.030)	(4.925)	(2.456)	(4.843)	(4.894)	(4.900)
LOGHHSZ2	-0.007	-.006	0.016	-0.037	-0.034	-0.037
	(-1.990)	(-2.158)	(-4.044)	(-6.527)	(-7.608)	(-6.554)
YR85	0.126	0.058	0.035	-0.009	0.013	-0.004
	(20.161)	(-.326)	(4.131)	(-0.789)	(1.328)	(-0.307)
YR86	0.073	0.031	0.027	-0.039	-0.015	-0.034
	(11.804)	(5.277)	(3.153)	(-3.174)	(-1.710)	(-2.683)
YR87	0.047	0.045	0.047	-0.020	-0.073	-0.015
	(7.316)	(7.651)	(5.548)	(-1.642)	(7.330)	(-1.117)
YR88	0.030	0.042	0.051	0.013	0.016	-0.008
	(4.625)	(7.098)	(6.132)	(-1.237)	(1.808)	(-0.674)
YR95	-0.022	0.009	0.007	-0.050	-0.012	0.011
	(-2.995)	(1.046)	(0.648)	(-3.809)	(-0.998)	(0.542)
1993 Export farmer						-0.0069
						(0.873)
1995 Export farmer						-0.0918
						(-3.604)
Adj. R-Square	-0.3255	0.2171	0.0499	0.0387	0.0587	0.0403

Source: Estimated from CILSS 1985-1988, Priority Survey 1993 and 1995.

One possible explanation is that during the period in which households were interviewed in 1995 (April-May), food expenditures were at a seasonal low and nonfood expenditures were at a seasonal high for West Forest export crop farmers. However, the 1985-1988 data do not support this hypothesis. Carrying out regressions similar to those presented in table 24, the regression coefficient for West Forest*cocoa and coffee farmers*April-May dummy is positive but not significant with respect to food, and negative but not significant for nonfood expenditures. Using these coefficients to produce a seasonally corrected estimate of food expenditure would reduce food expenditures and increase nonfood expenditures, thus further reducing the food shares of West Forest export crop households in 1995.

A second finding that casts some doubt on the large decline in poverty in the West Forest is the apparent undersampling of cocoa-growing households in 1995 compared to 1993. We suspect that there may have been undersampling because the percentage of cocoa-growing households in the West Forest fell from 63.3 percent to 50.6 percent of the total regional population, a drop of 20 percent.[30] As a result, in the West Forest, mean cocoa revenues per capita showed no increase -- from 16200 to 16032 CFAF -- between 1993 and 1995, in contrast to the East Forest, they increased by 30 percent from 11942 CFAF to 15489 CFAF (table 35). For the subset of households that declared earning cocoa revenues, mean real cocoa revenues went up 17 percent in the East Forest and 24 percent in the West Forest (table 36). Thus the stagnation in cocoa revenues in the West Forest is due to a decline in the percentage of households declaring cocoa revenues, rather than to a decline in the revenues of the households that do grow cocoa.

Table 35 Mean Export Crop Revenues Per Capita by Region
(in 1985 CFAF per year)

Region	*Cocoa*	*Coffee*	*Cotton*	*Total*
East Forest				
1993	11943	2197	23	14162
1995	15489	8381	0	23870
West Forest				
1993	16200	5990	444	22634
1995	16032	12646	4069	32747
Savannah				
1993	1556	1244	7315	10165
1995	852	1247	5387	7486

[30] While there was also a decline in the mean household size among cocoa growers, this does not account for the drop in the cocoa-growing population. Cocoa-growing households as a percentage of all households in West Forest fell from 55 percent in 1993 to 43 percent in 1995.

Table 36 Mean Export Crop Revenue of Households Growing Export Crops *(in 1985 CFAF per year)*

Region	Cocoa Farmers			Coffee Farmers			Cotton Farmer		
	Mean cocoa revenue per capita	*Weighted population*	*Share in regional population*	*Mean coffee revenue per capita*	*Weighted population*	*Share in regional population*	*Mean cotton revenue per capita*	*Weighted population*	*Share in regional population*
East Forest									
1993	20444	7148	58.4	6097	4408	36.0	9292	30	0.2
1995	23968	853	64.6	21134	524	39.7			
West Forest									
1993	25590	6391	63.3	11882	5090	50.4	21771	206	2.0
1995	31693	440	50.6	35894	306	35.2	64075	55	6.3
Savannah									
1993	15257	1026	10.2	8728	1434	14.3	26965	2729	27.1
1995	7599	111	11.2	9758	127	12.8	32460	164	16.5

It is highly unlikely that there would be no growth in cocoa revenues in the region of West Forest as a whole, in view of the fact that there was about a 10 percent increase in the real producer price of cocoa, and a 30 percent increase in cocoa production West Forest according to the CSSPA data. Thus, we conclude that cocoa-growing households are likely to have been undersampled in the West Forest.[31] If in fact cocoa-growing households were undersampled, it is likely that the households producing as much or more cocoa than the mean that were undersampled, since the increase in mean cocoa revenues among cocoa-growing households seems if anything understated, given the reported increase in production and producer prices.

Even if cocoa growing households were undersampled in the West Forest, however, it would not explain the drop in food shares, controlling for total expenditure, within the population of cocoa-growing households (and other export crop -growing households) that were sampled. Thus, it is an unresolved question as to why food shares dropped so significantly among this group. The drop in food shares seems to result from an underestimation of consumption of home production, leading to a downward bias in total expenditure. If so, then the incidence of poverty as indicated by the survey results would be biased upwards. However, we do not have a clear hypothesis about why home consumption fell precipitously among West Forest export crop farmers.

Poverty reduction among export crop farmers in the Savannah and East Forest

Mean household expenditure per capita of export crop farm households increased by 2.5 percent in East Forest, and by 9.2 percent in the Savannah (table 17). In view of the relatively large increase in household expenditure in the Savannah, it is surprising to find that export crop revenues from cocoa, coffee and cotton earned by export crop farm households in the Savannah actually declined by 7 percent, while export crop revenues increased by 55 percent in East Forest (table 37). What accounts, then, for the increase in mean household expenditure?

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[31] Coffee-growing households show a similar drop, not surprisingly, since there is a great deal of overlap between the two.

Table 37 Real Export Crop Revenue of Households Classified As Export Crop Farmers *(in 1985 CFAF per year)*

Region	*Cocoa*	*Coffee*	*Cotton*	*Total*
East Forest				
1993	21492	3801	18	25311
1995	25702	13414	0	39116
West Forest				
1993	22905	8305	506	31716
1995	24738	19493	6638	50869
Savannah				
1993	5156	3484	21592	302322
1995	3173	4297	20615	208085

Disaggregating households according to their primary source of export crop revenue reveals some interesting differences within regions that help to explain the apparent inconsistency between the increase in export crop earnings and the increase in household expenditures. Looking first at the East Forest, we find that household expenditures per capita increased by 10 percent among the group of households whose primary source of export revenue is cocoa (table 38). Cocoa revenues increased 27 percent among these households, and mean cocoa revenues in 1993 were 31 percent of household expenditure per capita. So the magnitude of the increase in per capita household expenditure is roughly what one expect.

The story for coffee farmers, however, is less consistent. Among the group of households whose primary source of revenue is from coffee, export crop revenues increased by 151 percent, primarily from coffee, and accounted for 19 percent of household expenditure in 1993. However, household expenditure per capita declined by 3 percent. Poverty declined among this group, however, suggesting that the decline in expenditure was more pronounced at the upper end of the expenditure distribution. The group of coffee farmers raises the mean export crop earnings while bringing down the mean expenditure increase for the region as a whole. So the puzzling finding is why expenditure went down among the group of coffee farmers, even though coffee revenues and total export crop earnings more than doubled.

Inconsistencies also exist among cotton farmers in the Savannah. In cotton-growing households, there is a 19 percent increase in cotton revenue, and a 24 percent increase in household expenditure, a much bigger increase than would be expected given that cotton revenue is equal to 44 percent of household expenditure. Hence the question is what accounts for the large rise in household expenditure among Savannah cotton farmers.

While the slight decline in export crop earnings among export crop farmers in the Savannah is due partly to the decline in the export earnings of the non cotton-growing export crop farmers, it also reflects the fact that the number of export farmers for whom cotton is the primary source of export crop revenue declines as a share of the total export crop household population from 61.4 percent in 1993 to 49.2 percent in 1995 (table 38). These results are mirrored if we look at all Savannah households growing cotton, not just export crop households. Mean cotton revenue per capita among the households growing cotton actually increased, but the cotton growing population declined from 27.1 to 16.5 percent (table 36). Thus, mean cotton revenue in the region declined. This decline in mean cotton revenue in the region is unexpected, as since real cotton prices went up by about 23 percent, whereas cotton production declined by about 12 percent between the 1992/93 and the 1994/95 campaigns. This would imply about an 8 percent increase in total cotton revenues. The decline in mean regional revenues suggests that cotton farmers were undersampled. However, some decline in the cotton-growing

Table 38 Export Crop Farmers Classified by Primary Source of Export Crop Revenue

Region	*Population*	*Percent of total export growing population*	*Headcount index of poverty*	*Mean cocoa revenue*[a)]	*Mean cotton revenue*[a)]	*Mean coffee revenue*[a)]	*Mean export crop revenue per capita*[a)]	*Household expenditure per capita*[a)]
East Forest								
Cocoa farmers								
1993	4979	81.3	0.412	25577	0	2701	29226	93035
1995	463	61.7	0.414	33593	0	3373	37023	102712
Coffee farmers								
1993	704	11.5	0.458	3520	0	13187	17401	92983
1995	275	36.4	0.412	12934	0	30737	43684	90401
Cotton farmers								
1993	11	0.2	0.000	0	9544	0	9544	107088
1995	0	0.0	0.000	0	0	0	0	0
Other export								
1993	426	7.0	0.285	4017	0	1232	27980	146419
1995	13	17.5	0.000	14663	0	4189	37571	159864
West Forest								
Cocoa farmers								
1993	4457	65.6	0.293	32693	47	5764	38814	118092
1995	276	51.8	0.539	41251	858	5120	47483	102629
Coffee farmers								
1993	1960	28.8	0.459	4439	0	15626	20170	90464
1995	199	37.3	0.448	9005	0	44865	53870	91389
Cotton farmers								
1993	101	1.5	0.160	266	31977	698	32941	126533
1995	52	9.8	0.592	0	63885	860	64745	72823
Other export								
1993	276	4.1	0.329	4282	0	133	38208	114046
1995	6	1.1	1.000	0	0	0	5441	41005
Savannah								
Cocoa farmers								
1993	613	22.4	0.342	21248	0	2686	24841	94775
1995	63	25.6	0.455	9374	0	1692	11066	77242
Coffee farmers								
1993	403	14.8	0.721	2310	540	19288	22695	71205
1995	62	25.2	0.572	3025	0	15361	18386	83969
Cotton farmers								
1993	1677	61.4	0.541	55	35037	63	35206	80387
1995	121	49.2	0.295	0	41970	0	41970	99628
Other export								
1993	39	1.4	0.574	1149	0	0	6091	88156
1995	0	0.0	0.000	0	0	0	0	0

[a)] In 1985 CFAF per year.

population might be expected, due to the fact that some households may have dropped out of cotton production because they were unable to finance the costs of the insecticides which they had to pay for upfront in the 1994/95 campaign. If so, revenues of the households that did continue to farm cotton should have increased enough to result in the overall projected increase in regional cotton revenues. Thus, poverty among export crop farmers in the Savannah may be biased upwards if indeed cotton farmers were undersampled in 1995.

Another difference between the East Forest and Savannah is revealed by the decomposition of the change in the poverty into the growth and redistribution effects index (table 39). The growth effect essentially indicates how much the poverty index would have changed had the change in each person in the population's expenditure been equal to the mean expenditure change, while the redistribution effect measures how much the poverty index would have changed due to the change in the distribution of expenditure, holding mean expenditure constant.

Table 39 Decomposition of the Change in Headcount Index of Poverty
(percentage points)

Region	*Change in poverty*	*Growth component*	*Distribution component*	*Residual*
East Forest				
Export crop farmer	-0.15	-4.44	3.85	0.45
Food crop farmer	15.33	9.78	6.33	-0.77
West Forest				
Export crop farmer	17.49	8.58	10.44	-1.53
Food crop farmer	9.11	0.90	5.89	2.32
Savannah				
Export crop farmer	-11.78	-7.11	-5.25	0.58
Food crop farmer	4.49	-4.57	9.14	-0.08
Côte d'Ivoire				
Export crop farmer	4.55	0.75	5.09	-1.30
Food crop farmer	8.74	0.89	8.31	-0.46

The redistribution effect was favorable in the Savannah, but sufficiently adverse in the East Forest that it more than offset the growth effect. One hypothesis is that the increase in coffee and cocoa prices tended to benefit nonpoor households more than poor households, under the assumption that the nonpoor households were in a better position to benefit from the increase in prices (e.g., ability to command more hired labor), but cotton revenues were more equally distributed. However, if anything, cotton revenues became more unequally distributed than cocoa or coffee revenues. In 1993, 28 percent of export revenue from cocoa went to the bottom 40 percent of the East Forest export crop farmer population, ranked by household expenditure per capita (table 40). In 1995, only 20 percent of the revenue went to the bottom 40 percent of the expenditure distribution.[32]

[32] Of course, one cannot automatically assume that a worsening of the distribution of export crop income reflects an inability of households with less export crop revenue to increase their export crop earnings at the same rate as households with more export crop revenue. For example, it is possible that all cocoa-growing households earned the same percentage increase in cocoa revenue, but that the distribution of other sources of income shifted, changing the apparent distribution of cocoa revenue. For example, households in the upper 40 percent of the expenditure distribution with relatively little cocoa revenue could have dropped into the bottom 40 percent as their other sources of income declined, while households in the lower 40 percent with large cocoa revenues may have received a boost in other sources of income that put them in the upper 60 percent. This would result in a

Table 40 Share of Export Crop Revenue earned by the Bottom 40% of the Rural Export Farmer Population[a)]

Region	*Cocoa*	*Coffee*	*Cotton*	*Total export crop revenue*
East Forest				
1993	28.3	25.8		27.0
1995	19.6	22.7		20.3
West Forest				
1993	17.8	24.1	6.7	19.6
1995	19.1	23.7	12.8	19.8
Savannah				
1993	16.0	40.6	25.5	25.5
1995	40.7	41.5	7.9	14.1

[a)] Population is ranked by household expenditure per capita.

In 1993 the Savannah, a similar percentage of cotton revenue -- 26 percent -- went to the bottom 40 percent of the export crop farm household population. In 1995, however, only 8 percent of cotton revenue went to the bottom 40 percent. One partial explanation for this finding might be due to the policy change that eliminated refinancing of inputs by the cotton marketing authority in the 1994/95 season. Farmers who were better able to afford the inputs might be in a better position to expand their production of cotton, with the result that cotton revenues became more unequally distributed.

The combination of the positive redistribution effect in the poverty decomposition and the apparent negative redistribution of cotton (and export crop) revenue in the Savannah is curious. The hypothesis that poor cotton growing households were undersampled in 1995 could account for the increase in per capita household expenditure as well as the favorable redistribution effect between 1993 and 1995, but it is unlikely to account for the increasing inequality in the distribution of cotton revenues. It is possible that cotton revenues may have become more unequally distributed at the same time that cotton farmers were undersampled. Given the deficiencies of the data, this remains a speculation.

The increase in poverty among food crop farmers

There was an increase in poverty between 1993 and 1995 among households classified as food crop farmers in all three rural regions (table 17). One reason may be the large decline in real staple food crop prices between 1993 and 1995. Yam, manioc, maize and millet prices declined between 10 and 25 percent, depending on the variety of yam. Only the real price of plantain and local rice remained relatively constant. The decline in real prices would benefit net purchasers of these commodities and work to the disadvantage of net sellers. Unfortunately, most households were not net purchasers. In

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deterioration in the distribution of cocoa revenue which would not have arisen from households being differentially placed to benefit from the increase in cocoa prices. Since the level of cocoa (and total export crop) revenues are positively and significantly associated with the level of household expenditure among export farm households, however, and since mean export crop revenue is about 30 percent of mean household expenditure, it is likely that there was some adverse redistribution of cocoa revenue among East Forest farmers. The same is true for cotton revenue among Savannah export crop farmers.

1993 only about a quarter of the farm population in East Forest and the Savannah were net purchasers, rising to 43 percent in West Forest (table 41). Even fewer food crop farm households were net purchases. Thus, few food crop farm households would have benefited from the decline in real staple food prices.

Table 41 Percentage of Farm Population by Net Sales Position of Major Food Staples [a)]

	1993			1995		
Region	*Net sellers*	*Neutral*	*Net purchases*	*Net sellers*	*Neutral*	*Net purchases*
Export crop farmers						
East Forest	36	41	23	41	49	11
West Forest	24	29	47	41	30	29
Savannah	35	28	37	26	42	32
Food crop farmers						
East Forest	45	36	18	35	53	12
West Forest	43	28	29	28	31	41
Savannah	66	14	20	52	41	7
Export and food crop farmers						
East Forest	40	39	21	39	50	11
West Forest	28	29	43	37	31	32
Savannah	56	18	26	44	41	15

[a)] Staple foods are manioc, yams, plantain, millet/sorghum, and maize. Net sellers are households in which the sales revenue from these crops exceeds purchases by 500 CFAF; which net consumers are households in which purchases exceed sales by 500 CFAF; Nuteral households comprise the remainder.

Nonetheless, among food crop farmers in the Savannah, mean per capita expenditures increased by 7.4 percent, in contrast to the other rural regions, where mean expenditures declined. However, poverty increased in the Savannah because there was an adverse redistribution effect. The redistribution effect was also adverse in the Forest regions. This raises two questions: what accounts for the increase in mean expenditure among primarily the better off food crop farm households in the Savannah, and what accounts for the adverse redistribution effect among food crop farmers in rural Côte d'Ivoire.

It is not clear why per capita expenditure of food crop farmers should have increased in the Savannah, compared to a 14.9 percent decline in East Forest and a 2.3 percent decline in West Forest.. Note that the better performance of the Savannah food crop farm household subgroup relative to East Forest food crop farmers parallels the differential observed in per capita household expenditure growth among cotton farmers in the Savannah and cocoa farmers in East Forest. One partial hypothesis stems from the observation that the Savannah is the only region in which mean per capita housing expenditures did not decline. While this might explain part of the relative difference in the change in mean per capita expenditure between regions, it certainly does not account for all of the disparity between East Forest and the Savannah.

One hypothesis for the adverse redistribution effect among rural food crop farmers is that the ratio of net sales of the four main staple food crops whose real price declined to total expenditure is larger for poor households than for non poor. Thus a decline in staple food crop revenues would cause a larger percentage decline in household expenditure in poor households. (Here we are assuming

implicitly that household expenditure is roughly equivalent to household income, so that a decline in net sales income would be reflected in the same absolute decline in household expenditure, all other things equal). What we find, however, is that among food crop households the ratios are quite close between the bottom 40 percent and top 60 percent of the population, and they are relatively small (table 42). So while this explanation does not seem promising to account for the adverse redistribution effect, it may also be that the surveys do not do a very good job of estimating marketed sales of food crops.

Table 42 Net Revenue From Staple Food Crops of Rural Food Crop Farmers[a)]

	Net staple food crop revenue/household expenditure			
	1993		*1995*	
Region	*Bottom 40% of population*	*Top 60% of population*	*Bottom 40% of population*	*Top 60% of population*
East Forest	2.5	2.3	0.9	1.0
West Forest	7.7	7.0	-2.3	-1.1
Savannah	9.1	8.6	6.0	1.7

[a)] Net revenue is crop revenue less purchases. The staple crops are maize, manioc, millet and yam.
[b)] Population is ranked by household expenditure per capita.

Furthermore, as explained above, the used of a single inflation rate to deflate the expenditures of poor and non-poor households may also bias the results slightly towards an adverse redistribution pattern. Another partial explanation may relate to the housing variable. The estimating equation for housing cost yields large negative dummies for the 1995 regional dummies. Since housing as a share of expenditure declines as expenditure increases, the use of a single dummy would result in a larger decrease, relative to total expenditure, of total per capita expenditure among poorer households. All other things being equal, this would tend to yield an adverse redistribution effect.

Conclusion

In the short run, the devaluation accompanied by the increased in export taxation did not appear to alter the pattern of poverty that took shape prior to the devaluation, assuming that the results of the 1993 and 1995 surveys are roughly accurate, about which there is considerable cause for doubt. Abidjan experienced the largest increase in poverty between 1993 and 1995. Food crop farmers in rural areas got absolutely poorer. And depending on whether or not one accepts the 1995 West Forest results, export crop farmers got slightly worse off or remained about the same. The increase in poverty among food crop farmers is likely linked to the downward trend in real food crop prices evident in the pre-devaluation period 1987-1993 , which continued after the devaluation. As producers of nontradables, it would be expected that food crop farmer would not have benefited from the devaluation in the short term unless a substantial part of their income comes from wage labor or off-farm sources. Unfortunately we know very little about the sources of income of food crop farmers. The failure of export crop farmers to show a more important decline in poverty is due to several things: first the survey took place relatively soon after the devaluation, so that coffee and cocoa farmers had little time to respond to higher crop prices. A second reason, particularly relevant for cocoa, is that the government taxed away much of the benefit of the devaluation and the price increase. Only for coffee was there a real price increase of any appreciable magnitude between the devaluation and the time of the 1995 survey. And curiously, among the households in East Forest and West Forest whose major source of income is coffee, there was little if any growth in household expenditure per capita.

It is important to remember that the 1995 survey was carried out in the early part of 1995, before the economic recovery had taken hold. The 1995 survey thus provides a picture only of the short-run impact of the devaluation and accompanying policy measures. In aggregate, one would expect that poverty would have begun to fall in 1996, given the strong economic turnaround observed in 1995 and 1996. The strong growth in the secondary and tertiary sector of the economy is likely to have a positive impact on reducing urban poverty. While agricultural growth is positive, it would appear to be somewhat selective. To the extent that it bypasses many of the food crop and only partially touches cocoa farmers, its impact will be limited. Since food crop farmers account for roughly a quarter of Côte d'Ivoire's population, and are the poorest socioeconomic group, whether or not they benefit from growth in aggregate demand will have a large bearing on what happens to overall rates of poverty. The rate at which poverty declines among this group of farmers may depend more on the fortunes of the export crop sector and what happens in the rural labor market, assuming that real producer price of the main staple food crops continues to decline. Heavy taxation of export crop farmers has repercussions not only on export crop farm households but also on food crop farm households.

While taxation of export crop farmers (as a share of the world price) has decreased since the devaluation, export crop farmers, especially cocoa farmers, are still being taxed. The tax is often justified on the grounds that Côte d'Ivoire has an important share of the cocoa market, and that restricting supply by taxing cocoa producers raises world prices and increases the gains to Côte d'Ivoire. Analysis suggests that in the past the actual level of taxation exceeded the optimal level (World Bank, 1994; Panagariya and Schiff, 1990) although the gap between the optimal and actual export tax may be narrowing at present. Unfortunately, the burden of taxation falls heavily on the poor as over a third of the export crop farmers who derive the majority of their revenue from cocoa are poor. And of course, there are also poor farmers who derive the majority of their income from coffee who also grow cocoa, as well as some poor food crop farmers who earn some revenue from cocoa. Even if the level of actual taxation were justified from the standpoint of maximizing Côte d'Ivoire's earnings from cocoa, it is not at all clear that the use to which the tax revenue from cocoa is put has a significant impact on poverty reduction. As Demery et al. (1995) point out, social spending is not highly progressive. And the benefits that would come from an increase in public investment spending on infrastructure may not accrue to the rural poor in the short term, to the extent that spending takes place largely in urban areas. Clearly, a reexamination of cocoa taxation policies is an essential element of a poverty reduction strategy.

Finally, the analysis of the data revealed a number of suspected biases which lead us to conclude that overall that in the short run, the results of the 1993 and 1995 surveys are probably biased in the direction of overestimating the incidence of poverty in 1995 relative to 1993. The principal sources of suspected bias are the following. First, the sampling bias in 1993 which resulted in the oversampling of less mobile households is suspected to have resulted in an underestimation of poverty in 1993 in the non-Abidjan part of the sample. Second, the procedure used to correct the consumption of home production aggregate in 1993 may have resulted in an overestimate of home production in 1993, and thus an underestimate of poverty. Third, the procedure used to calculate purchased food expenditure (declared months multiplied by monthly expenditure) may have resulted in a downward bias in food expenditures in 1995 relative to 1993. Fourth, the fact that the expenditure shares used in the CPI assume much higher shares for luxury items (and in particular non-staple foods) may result in an overestimate of the inflation rate, particularly for poor households, and thus to an underestimate of household expenditure in rural areas in 1995 relative to 1993. Fifth, there are good reasons to question the validity of the sharp increase in poverty in West Forest between 1993 and 1995. On the other hand, it is difficult to know whether the relatively stronger performance of the Savannah farmers between 1993 and 1995 is simply a reflection of the relative absence of the type of suspected biases described above, or whether it too reflects a bias, but in the opposite direction. Thus, while the direction of the

biases generally point in the direction of an overestimate of poverty in 1995, there are still a number of unknowns--particularly the small sample size and lack of region-specific price data--that make it impossible to draw firm conclusions about the direction of the change in poverty between 1993 and 1995.

The deficiencies of the 1993 and 1995 household surveys lead to a number of recommendations to improve the reliability of the conclusions. First, more attention needs to be paid to assuring the comparability of the surveys as well as to developing region-specific consumer price indicators if one of the purposes of the household surveys is to monitor the change in poverty over time. A particularly important issue for surveys of the priority-type format is the reliability and comparability over time of the method used to estimate food expenditures. A second lesson is that the ability to explain the trends observed in the poverty data depends to a large part on being able to understand the trends in the various components of household income. This is a weak point of many household surveys, especially household priority surveys. A third recommendation would be to pursue some of the qualitative analysis once the results of the quantitative surveys are available to explore whether the trends reported in the data make sense on the ground. A fourth recommendation would be to give some thought to sample size so that region-specific cell sizes for the major socioeconomic groups are sufficiently large to make meaningful comparisons possible. For example, given the difference in pricing policies applied to cocoa and coffee, it would be interesting in future studies to examine the evolution of poverty between these two groups of farmers. A fifth recommendation would be to examine how well the socioeconomic classification used in the 1993 and 1995 surveys correlates with the primary source of income of the household.[33] A sixth recommendation would be to consider in greater detail whether the limited time frame of the priority survey will yield accurate estimates of expenditure given seasonality in expenditures. If a limited time frame is adopted, including questions on normative monthly food purchases would be a useful supplement to the monthly recall estimate for those households that do not purchase an item during all months of the year.

Three puzzles emerge from the household survey data that merit special consideration in future household surveys in Côte d'Ivoire. First, what accounts for the huge increase in poverty at various points in time in the West Forest ? Are there special sampling problems in the West Forest? Or special difficulties in estimating the value of consumption of home production? Second, why did the Savannah do relatively much better than the Forest region after the devaluation? Here one suspects that the problem may be misspecification of the regional deflators. But perhaps off-farm sources of income may vary significantly from the rest of the country. And third, did the situation of agricultural workers really improve between 1993 and 1995? If so, will it continue to improve? What will happen to labor earnings as the land frontier vanishes? Labor will become a less scarce commodity, and the forms of labor hire, which have depended heavily on sharecropping-type contracts which give the sharecropper eventual rights to the land, will likely shift. It would be useful in future surveys to think about ways of distinguishing among different types of agricultural workers. At this point in time, the household surveys in Côte d'Ivoire raise as many questions as they answer about the changes in poverty over time.

[33] Unfortunately the analyses that have been carried out of poverty rates among different socioeconomic groups with respect to the 1985-1988 do not provide information about how the classification of the socioeconomic groups correlates with sources of income.

References

Appleton, Simon. 1994. *Problems of Measuring Changes in Poverty over Time: The Case of Uganda 1989-92.* Centre for the Study of African Economies Working Paper Series No. 95-1. University of Oxford, Oxford.

Chen, Shaohua, Gaurav Datt, and Martin Ravallion. 1994. "Is Poverty Increasing in the Developing World?" *Review of Income and Wealth* 40 (4): 359-376.

Coulombe, Harold, and Lionel Demery. 1993. *Household Size in Côte d'Ivoire, Sampling Bias in the CILSS.* LSMS Working Paper Series No. 97. The World Bank, Washington, DC.

Côte d'Ivorie. 1996. *Rapport Economique.* Direction de la Conjoncture et de la Prévision Economique. Ministère Delegué Auprès du Premier Ministre, Chargé de l'Economie des Finance et du Plan, Abidjan, Côte d'Ivoire.

Deaton, Angus and John Muellbauer. 1985. *Economics and Consumer Behavior.* Cambridge: Cambridge University Press.

Demery, Lionel. 1994. "Côte d'Ivoire: Fettered Adjustment," pp. 72-152, in I. Husain and R. Faruqee (eds.), *Adjustment in Africa: Lessons from Country Case Studies.* The World Bank, Washington, DC.

_____ and Christiaan Grootaert. 1993. "Correcting for Sampling Bias in the Measurement of Welfare and Poverty in the Côte d'Ivoire." *The World Bank Economic Review.* 7 (3): 263-292.

_____ Dayton, J., and Mehra, K. 1995. *The Incidence of Public Spending in Côte d'Ivoire.* World Bank, Washington, D.C.

Goreux, Luis M. 1995. *"La Devaluation Du Franc CFA: Un Premier Bilan En Decembre 1995".* Processed.

Grootaert, Christiaan. 1996. *Analyzing Poverty and Policy Reform - The Experience of Côte d'Ivoire.* London: Arebury Press.

_____ 1995. "Structural Change and Poverty in Africa, A Decomposition Analysis for Côte d'Ivoire." *Journal of Development Economics* 4 (7): 375-401.

_____ and Ravi Kanbur. 1994. "A New Regional Price Index for Côte d'Ivoire Using Data from the International Comparisons Project," *Journal of African Economies* 3 (1): 114-141.

Hinkle, Lawrence E. and Fabien Nsengiyumva. 1995a. *External Real Exchange Rate Indexes: A User's Guide to Concepts, Measurement, and Interpretation.* World Bank, Washington, DC.

Hinkle, Lawrence E. and Fabien Nsengiyumva. 1995b. *Internal Real Exchange Rates: A User's Guide to Concepts, Measure, and Interpretation.* World Bank, Washington, DC.

Jones, Christine. 1995. *Accounting for the Reduction in Rural Poverty in Ghana 1988-1992.* Policy and Social Policy Discussion Paper Series No. 84. The World Bank, Washington, DC.

Leenhardt, Blaise and Benoît Massuyeau. 1995. *La Hausse Des Prix En Zone Franc En 1994.* Caisse Francaise de Développement, Paris.

Oh, Gi-Taik and Merra Venkataraman. 1992. *Construction of Analytic Variables and Data Sets Using Data From The Côte d'Ivoire Living Standards Survey 1985-88.* Poverty and Social Policy Division, Africa Region, The World Bank, Washington, DC.

Pallix, Gérard. 1995. *Evaluation de l'Impact sur l' Environnement de la Devaluation du F.CFA.* BDPA-SCETAGRI, Consultant report produced for Ministère de la Cooperation, France.

Pangariya, Arvind and Maurice Schiff. 1990. *Commodity Exports and Real Income in Africa.* Policy Research Working Paper Series No. 537. The World Bank, Washington, DC.

Ravallion, Martin. 1990. "Rural Welfare Effects of Food Price Changes Under Induced Wage Responses: Theory and Evidence For Bangladesh," *Oxford Economic Papers* (42): 574-585.

_____and Dominique van de Walle. 1989. *Cost-of-Living Differences between Urban and Rural Areas in Indonesia.* Working Paper Series No. 341, Agriculture and Rural Development Department, The World Bank, Washington, DC.

World Bank. 1990. *Making Adjustment Work for the Poor, A Framework for Policy Reform in Africa.* The World Bank, Washington, DC.

_____World bank. 1994. *Republic of Côte d'Ivoire, Agricultural Sector Review. Vol. II: Constraints and Potentials By Commodity Sub-Sectors.* The World Bank, Washington, D.C. Draft of April 30, 1994.

_____World Bank. 1995. *Republic of Côte d'Ivoire, Country Economic Memorandum.* The World Bank, Washington, D.C. Draft of June 27, 1995.

Appendix A: Changes Made to the INS 1993 and 1995 Data Sets

Two major changes were made to the INS data. The first concerns the estimation of the hedonic rent equation using to impute housing expenditure for those households that do not rent. The second concerns the definition of socioeconomic groups.

Housing expenditure

The 1993 and 1995 surveys use a hedonic rental equation to impute housing expenditure for the approximately two thirds of the population that are not renters. The rental equation in 1993 includes variables for housing type, number of rooms, type of lighting, access to water, method of refuse collection, and toilet facilities. Regional dummies are also added. The variables in the estimating equation were changed in the 1995 to include variables for the types of wall and roofing material. The number of dummies in the categories of housing types, lighting and water supply were also reduced in 1995, due to the very limited number of observations in some of the categories resulting from the very small size of the 1995 sample.

Furthermore, outliers were not omitted before estimating the 1995 rental equation.[1] Given the small size of the sample they can have a large influence. The very small number of observations on renters in rural area may also yield potentially distorted results. For example, only 9 households in West Forest and 12 households in the Savannah (weighted) rented lodging in 1995.

Real housing expenditures, as estimated by separate equations for 1993 and 1995, and share of housing expenditure are presented in tables A.1 and A.2. There is a large decline in housing expenditures in the urban regions and a increase in the rural regions. The 47 percent increase in housing expenditure in the Savannah is particularly suspect.

Table A.1 Housing Expenditure Per Capita - 1993 and 1995 Estimated Separately *(in 1985 CFAF per year)*

	Lodging	
	1993	*1995*
Abidjan	30185	25999
Other Cities	16733	13691
East Forest	14189	15200
West Forest	17175	18681
Savannah	14344	21046
All	18459	19156

[1] A few computer programming errors were also made in specifying this equation, so the housing variable contained in the INS data set is incorrect. The results presented here are based on the corrected data set, with subsequent correction for outliers.

Table A.2 Composition of Expenditure - 1993 and 1995 Estimated Separately

	1993			1995		
	Food	*Lodging*	*Other*	*Food*	*Lodging*	*Other*
Abidjan	34.1	13.1	52.8	34.1	13.8	52.2
Other Cities	43.7	13.3	43.0	46.9	11.4	41.6
East Forest	56.0	13.8	30.2	55.8	14.8	29.4
West Forest	58.3	15.8	25.9	50.2	17.8	32.0
Savannah	60.2	16.3	23.4	55.9	21.1	23.0
All	46.6	14.0	39.3	45.8	15.2	39.1

Since the use of different specifications of the hedonic rent equation may create problems of comparability, we decided to pool the 1993 and 1995 and estimate rental expenditures using one equation. Before doing that, however, we eliminated outliers in rental expenditures in the 1993 and 1995 data according to the role of thumb that was used to clean other variables, namely those values which were more than five standard deviations from the regional mean. We then pooled the 1993 and 1995 data and used the 1993 rental equation to derive imputed rents. Regional dummies interacted with a dummy for 1995 were added to the estimating equation to allow for the possibility that rental expenditures evolved differently across regions between 1993 and 1995. Outliers in the housing variable (combining imputed or actual rent with housing maintenance expenditures) were then replaced with regional means using the cleaning procedure that was used on other aggregate expenditure variables in both data sets. The small sample size in 1995 may still yield distorted regional 1995 dummies if the data contain observations contaminated by large recall errors.

Tables A.3 and A.4 present the estimates of housing expenditure and share of housing expenditure using the 1993 estimating equation on the pooled 1993 and 1995 sample. As the comparison with tables A.1 and A.2 shows, the two methods produce quite different values of mean housing expenditure in 1995, particularly in the rural regions. The pooled estimate results in a decline between 1993 and 1995 in housing expenditures in four of the five regions, with the expenditures in the Savannah remaining virtually unchanged. The decline in Abidjan is less dramatic than the large decrease observed in table A.1. In view of the fact that housing is a nontradable and real housing prices declined after the devaluation (based on the CPI data), the fall in real housing costs obtained using the pooled sample is entirely plausible. The large increase in housing expenditures in the Savannah from the nonpooled approach is less plausible, as there is little reason to think that the quality of housing improved substantially or that housing prices increased dramatically. However, even with the pooled approach, the Savannah still appears to be an outlier, as real housing costs decline in other regions, but remain essentially unchanged in the Savannah.

Table A.3 Housing Expenditure Per Capita - Pooled Equation for 1993 and 1995 *(in 1985 CFAF per year)*

	Lodging	
	1993	*1995*
Abidjan	25319	23209
Other Cities	16139	12281
East Forest	12773	10909
West Forest	14303	10081
Savannah	12543	12568
All	16236	14288

Table A.4 Composition of Expenditure - Pooled Equation for 1993 and 1995

	1993			*1995*		
	Food	*Lodging*	*Other*	*Food*	*Lodging*	*Other*
Abidjan	34.8	11.2	54.0	34.6	12.5	52.9
Other Cities	43.9	12.9	43.2	47.5	10.4	42.1
East Forest	56.8	12.6	30.6	58.2	11.1	30.7
West Forest	59.9	13.5	26.6	54.7	10.5	34.8
Savannah	61.5	14.6	23.9	61.1	13.8	25.1
All	47.4	12.6	40.0	47.6	11.8	40.7

In our view, the pooled estimate methodology is more defensible methodologically and yields results that appear to be more in line with other economic indicators than the nonpooled estimate using different hedonic equations. Hence, it is the method used in this paper. The choice has implications for the trend in poverty as table A.5 shows. The use of pooled equation to estimate housing expenditure increases the rise in poverty between 1983 and 1993, as it reduces the large increase in household expenditure per capita. The major difference between the two methods occurs in the Savannah region.[2] The use of separate equations results in a large decrease in poverty in the Savannah between 1993 and 1995. With the pooled equation approach, poverty remains unchanged.

Table A.5 Headcount Index of Poverty Using Different Housing Variables *(poverty line = 75,000 CFAF in 1985 CFAF)*

	Separate Equations for 1993 and 1995		*Pooled Equations for 1993 and 1995*	
	1993	*1995*	*1993*	*1995*
Abidjan	.048	.183	.051	.202
Other Cities	.313	.285	.312	.286
East Forest	.373	.396	.389	.410
West Forest	.356	.460	.382	.501
Savannah	.485	.417	.494	.494
All	.313	.339	.323	.386

[2] There is a statistically significant drop in the food share in the Savannah of almost six percentage points between 1993 and 1995 in an Engel curve-type regression in which food share is regressed on household size and household expenditure, if housing expenditure is estimated separately for 1993 and 1995. With the pooled sample, however, the difference in food shares between 1993 and 1995 is not statistically significant.

Redefinition of Socioeconomic Groups, 1993 and 1995

Inconsistencies exist in INS data set in the way agricultural workers were defined between the 1993 and 1995 survey years. Households were classified as farmers in 1993 if the head of household reports his/her sector of activity as agriculture and is either an independent or an employee. However, even if the household head is not reported as working in the agricultural sector, if the household declares its head to be an "exploitant" in the agricultural section of the questionnaire, then the household is classified as being a farm household. A second stage classification was then performed. All agricultural farmer households were then reclassified as being farmers if their agricultural marketed surplus was greater than zero, and a worker if marketed surplus equaled zero, irrespective of whether they initially declared the head to an agricultural independent or a worker.

In processing the 1995 data, INS adopted a slightly different approach. The first change was that only farmer households whose head was reported as an independent in 1995 were reclassified as being agricultural worker households if they had zero marketed surplus income. Households that reported the head to be an agricultural employee remained classified as an agricultural worker, irrespective of whether the household had marketed surplus. The second change was that the second filter for establishing whether a household was an agricultural household, i.e., whether the household head report him/herself as being "exploitant," was not included since this question was eliminated from the agricultural section of the 1995 questionnaire.

To make the definitions of agricultural farmer and worker households more consistent across years, we redefined farmer/worker households as follows. First, we eliminated the second filter of agricultural "exploitant" in 1993. This affected 215 households. Second, we classified all households that declared the head to be a worker as agricultural worker households, irrespective of whether they had marketed surplus or not, following the 1995 definition. Third, unlike the practice in both 1993 and 1995, we did not reclassify households whose heads declared themselves as independents as agricultural worker households if they reported no marketed farm income. Simply because a household reported no marketed surplus did not seem sufficient reason to assume that the principal occupation of the household head was an agricultural worker. Thus, in the 1993 data set, 55 independent worker households with marketed surplus income were retained as agricultural workers, while 325 independent agricultural households which had zero farm revenue were reclassified from agricultural worker to food farmer households . In 1995, 27 independent farmer households with zero farm income were reclassified from being agricultural workers to food farmer households.[3] Table A.6 presents the incidence of poverty by socioeconomic group, after reclassification. As it shows, the reclassification does not alter the basic conclusions, although it substantially reduces the size of the population classified as agricultural workers.

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[3] In addition, there were seven households classified as export crop workers in the INS data file that should have been classified as food crop workers according to the criterion given in 1993 that export crop revenue must be greater or equal to twice food crop revenue to be classified as an export crop farmer. In the absence of the final program that was used to create the socioeconomic group variable, we do not know how these households came to classified as they were in the INS data set. We reclassified five of them as food crop households; the other two had very high values of hunting or livestock income that were potentially due to a problem in coding the unit of time so we maintained them as export crop households.

Table A.6 Headcount Index of Poverty by Socioeconomic Group, Based on Two Definitions of Agricultural Farmer and Worker

(Poverty Line=75000 in 1985 CFAF)

	Reclassified				*INS Definition*			
	Headcount Index		*Weighted population*		*Headcount Index*		*Weighted population*	
	1993	*1995*	*1993*	*1995*	*1993*	*1995*	*1993*	*1995*
Export Crop Farm	.394	.432	16576	1582	.395	.431	16704	1619
Food Crop Farmer	.492	.584	13507	1149	.479	.597	12398	1065
Agriculture Worker	.531	.364	843	237	.514	.375	2852	284
Public Employee	.076	.140	6062	446	.072	.140	5936	446
Priv. Formal Emp.	.071	.075	4137	431	.069	.075	3958	431
Priv. Inform Emp.	.254	.310	2464	976	.223	.310	2273	976
Self Emp-Formal	.078		125		.080		122	
Self Emp-Informal	.248	.293	8229	267	.242	.293	7790	267
Unemployed	.202	.528	661	60	.202	.528	661	60
Inactive	.271	.191	4096	312	.263	.191	4004	312
Côte d'Ivoire	.323	.368	56700	5461	.323	.368	56700	5461

Appendix B: Comparing the 1985-1988, 1993 and 1995 Côte d'Ivoire Household Surveys

This note investigates some of the comparability issues in using the 1985-1988 Côte d'Ivoire household Living Standards Measurement Surveys (CILSS) and the 1993 and 1995 household priority surveys to track the evolution of poverty over time. The first is related to the different methods used to estimate food expenditures. The second comparability issue addressed in this note is the construction of the price deflators for the survey.[4]

Comparability in the method of estimating food purchases

One of the biggest changes between the 1980s and the 1990s surveys concerns the way food purchases were estimated. The 1985-1988 CILSS surveys used two methods to estimate food purchased. The first asked households to recall their food purchases over the past two weeks. This estimate was then multiplied by 26 to obtain an annual estimate. The second method of estimating purchased food expenditure is to ask households to recall how many months they consumed a good and how much they spent on average during the months they consumed. These two responses are then multiplied to obtain an annual estimate of consumption. To facilitate discussion we shall refer to the former method as the "two week annualized estimate" and the latter as the "normative annual estimate." The expenditure estimate used in much of the Côte d'Ivoire poverty literature is an average of the two week annualized estimate and the normative annual estimate. This third estimate will be referred to as the "average estimate."

In principle, the two week annualized estimate and the normative annual estimate should yield the same sample mean, though the variance is likely to differ. The two week annualized estimate will show greater variance, since some households will be interviewed at a point in the year when they did not make a purchase of a particular item during the past two weeks, even though they purchase the good at other times of the year. The two week annualized method will tend to underestimate the annual expenditure of these households, while it will overestimate the annual expenditure of households that made positive purchases in the previous two weeks but did not purchase the item throughout the year. Under a number of assumptions, the overestimate should offset the underestimate so that the mean food expenditure as estimated by the two methods would be equal. In fact, in the 1985-1988 surveys, mean two week annualized estimate of purchased food expenditure is less than the mean normative estimate in urban areas, where purchased food comprises a larger share of total food expenditure, while in rural areas there is more variability (table B.1). The poverty estimates based on the two methods of calculating purchased food expenditure also differ slightly (table B.2), though not necessarily in the same direction as the purchased food expenditure aggregates.

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[4] A third issue, seasonality, is addressed in the text. It arises because in 1993 and 1995, household interviews were compressed into a period of several months, in contrast to the earlier surveys, in which the interviews were spread out over the course of a year.

Table B.1 Mean Annual Purchased Food Expenditure Per Capita
(in 1985 CFAF)

	2 week annualized[a)]	*Normative*[b)]	*Average*[c)]	*Declared months 2 weeks*[d)]
1985				
Regions				
Abidjan	148195	156646	152420	145825
Other Cities	85738	102052	93895	80244
East Forest	47250	47349	47299	39922
West Forest	73861	74573	74217	63310
Savannah	34474	40467	37470	30207
Côte d'Ivoire	76759	83339	80049	71020
1986				
Regions				
Abidjan	106488	119044	112766	105339
Other cities	84307	85134	84720	80856
East forest	40766	43355	42061	36976
West forest	59098	57318	58208	50906
Savannah	34245	33155	33700	31645
Côte d'Ivoire	65125	67979	66552	61558
1987				
Regions				
Abidjan	103174	109302	106238	101694
Other cities	74297	82653	78475	71808
East forest	44710	43650	44180	39052
West forest	48114	40462	44288	39455
Savannah	24934	24864	24899	22298
Côte d'Ivoire	57841	59769	58805	54083
1988				
Regions				
Abidjan	86874	90886	88880	86316
Other Cities	57347	59485	58416	54311
East Forest	38108	37881	37994	33415
West Forest	30349	27725	29037	25771
Savannah	22285	19218	20752	19308
Côte d'Ivoire	45951	45967	45959	42724

a) Two week recall estimate multiplied by 26.
b) Product of the declared months and normative monthly expenditure (number of times purchased per month multiplied by the amount spent each month).
c) Average of the two week recall and normative estimates.
d) Two week recall (on monthly basis) multiplied by the declared number of months.

Table B.2 Poverty Estimates Based on Different Methods of Estimating Purchased Food Expenditure *(Poverty line = 128,600 in 1985 CFAF).*

	2 week annualized[a]	*Normative*[b]	*Average*[c]	*Declared months 2 weeks*[d]
1985				
Region				
Abidjan	0.032	0.042	0.034	0.034
Other Cities	0.258	0.264	0.254	0.275
East Forest	0.475	0.487	0.479	0.503
West Forest	0.132	0.151	0.129	0.178
Savannah	0.552	0.537	0.539	0.568
Côte d'Ivoire	0.308	0.313	0.305	0.328
1986				
Region				
Abidjan	0.176	0.160	0.175	0.178
Other Cities	0.242	0.249	0.246	0.252
East Forest	0.413	0.394	0.399	0.428
West Forest	0.227	0.222	0.219	0.246
Savannah	0.490	0.504	0.493	0.505
Côte d'Ivoire	0.316	0.311	0.312	0.327
1987				
Region				
Abidjan	0.132	0.122	0.131	0.132
Other Cities	0.321	0.278	0.305	0.328
East Forest	0.487	0.457	0.475	0.510
West Forest	0.442	0.488	0.487	0.506
Savannah	0.612	0.625	0.604	0.625
Côte d'Ivoire	0.409	0.398	0.405	0.426
1988				
Region				
Abidjan	0.185	0.174	0.169	0.185
Other Cities	0.498	0.506	0.486	0.506
East Forest	0.546	0.545	0.545	0.551
West Forest	0.592	0.614	0.589	0.619
Savannah	0.701	0.717	0.710	0.714
Côte d'Ivoire	0.515	0.522	0.511	0.525

a) Two week recall estimate multiplied by 26.

b) Product of the declared months and normative monthly expenditure (number of times purchased per month multiplied by the amount spent each month).

c) Average of the two week recall and normative estimates.

d) Two week recall (on monthly basis) multiplied by the declared number of months.

The Côte d'Ivoire data is not the only country in which the two week annualized estimate tended to yield lower mean purchased food expenditure than the normative estimate. An analysis of the two years of the LSMS survey data from Ghana (GLSS1 and GLSS2) also revealed the same tendency, as table B.3 shows. While the ranking of households does not appear to be very sensitive to the two estimates (Grosch et al, 1995), understanding why the sample means are different may provide some insight as to which estimate may be preferred, or at least the likely direction of the bias in mean per capita expenditure if surveys switch methods over time.

Table B.3 Ghana: A Comparison of Two-week Recall[a)] and Normative[b)] Estimates of Purchased Food Expenditure Per Capita *(in 1988 cedis)*

	GLSS1		*GLSS2*	
Region	*Two week annualized*	*Normative*	*Two week annualized*	*Normative*
Accra	149223	162122	124252	133324
Other Urban	90250	100665	91967	99539
Rural Coastal	76958	84589	72394	71839
Rural Forest	59502	68163	63741	66270
Rural Savannah	34457	39973	35722	42973
Côte d Ivoire	71771	80309	70890	75747

a) Two week recall estimate multiplied by 26.

b) Product of the declared months and normative monthly expenditure (number of times purchased per month multiplied by the amount spent each time).

Decomposing the difference between the two-week annualized and the normative estimates, 1985-1988

To understand the sources of the difference, it is useful to decompose the difference between the two week recall and the normative annual means into three components:

(1) The first is the difference between the "effective months of consumption" and the mean number of months of reported consumption for the households reporting a positive number of months of consumption. The effective months of consumption is calculated by taking the ratio of the population reporting positive two week purchases to the population reporting a positive number of months of consumption and multiplying by 12. Assuming that households are surveyed evenly throughout the year, the effective months of consumption should equal mean reported months of consumption for any individual commodity.

(2) The second is the difference between mean two week expenditure, on a monthly basis, for all households reporting positive two week expenditures, and mean monthly normative expenditure for the same set of households. If there were no recall bias, one would expect the means of these estimates to be equal.

(3) The third is the covariance between the number of months of reported consumption and normative monthly expenditure. If the covariance is not zero, then the method of annualizing the two week recall estimate would not yield the same mean as the normative annual estimate, even if the differences described in (1) and (2) were zero.

To derive the decomposition, mean two-week annualized purchased food expenditure of the population reporting positive annual expenditure can be written as follows:

$$\bar{x}_{annual\ 2\ wk} = 12\ \frac{\sum_{i=1}^{q} x^i_{2\ wk}}{q} = 12 \cdot \frac{\left(\sum_{i=1}^{n} x^i_{2\ wk>0} + \sum_{i=n+1}^{q} x^i_{2\ wk=0} \right)}{q} \qquad (1)$$

$$= \frac{12 \cdot n\ \frac{\sum_{i=1}^{n} x^i_{2\ wk>0}}{n}}{q} = \frac{12\ .\ n}{q} \cdot \bar{x}_{2\ wk>0}$$

where x^i_{2wk} is person i's two week expenditure (on a monthly basis) on commodity x, q is the population reporting a positive number of months of purchase, and n is the population reporting positive two week purchases, with n therefore less than or equal to q. Thus, $\bar{x}_{2wk>0}$ is the mean two week expenditure of the population reporting positive two week expenditure, while $12 \cdot n/q$ is the effective months of consumption. The mean normative annual expenditure can be written as follows:

$$\bar{x}_{annual\ norm} = \sum_{i=1}^{q} m^i\ x^i_{norm} \qquad (2)$$

where m^i is the reported months of purchase of person i and x^i_{norm} is normative monthly expenditure of person i. We can then decompose the difference between mean two week and mean annual normative expenditure as follows:

$$\bar{x}_{annual\ 2\ wk} - \bar{x}_{annual\ norm} = \frac{12 \cdot n}{q} \cdot \bar{x}_{2\ wk>0} - \sum_{i=1}^{q} m^i x^i_{norm} \tag{3}$$

$$= \bar{x}_{2\ wk>0} \cdot \left(\frac{12 \cdot n}{q} - \frac{\sum_{i=1}^{q} m^i}{q} \right) \tag{3a}$$

$$+\bar{m} \left(\frac{\sum_{i=1}^{n} x_{2\ wk>0}}{n} - \frac{\sum_{i=1}^{q} x^i_{norm}}{q} \right) \tag{3b}$$

$$+\bar{m} \frac{\sum_{i=1}^{q} x^i_{norm}}{q} - \frac{\sum_{i=1}^{q} m^i \cdot x^i_{norm}}{q} \tag{3c}$$

Where $\bar{m} = \frac{\sum_{i=1}^{q} m^i}{q}$ is mean reported months of purchase.

Essentially, expression (3a) is the difference between the effective and mean reported months; (3b) is the difference between mean two week expenditure (over the population reporting positive two expenditure) and mean monthly normative expenditure (over the population reporting positive normative expenditure) and (3c) is the covariance between reported months and monthly expenditure, multiplied by minus one. To derive the difference between mean annual two week and normative expenditure over the entire population *p* and over all commodities, we multiply expression (3) by *q/p* and sum over all commodities *x*.

Tables B.4a and B.4b present the results of the decomposition for Ghana and Côte d'Ivoire, where columns (a), (b), and (c) correspond to the expressions 3(a), 3(b) and 3(c), weighted by q/p and summed over all commodities. For both countries, the difference between the effective and mean reported months of consumption is almost always negative, suggesting that there is a tendency for households to overstate the number of months they consumed a product. One explanation might be that respondents tend to round up the number of months of consumption. The difference is a much higher percentage of food expenditure in Côte d'Ivoire than in Ghana.

Table B.4a Ghana: Decomposition of the Difference Between Two Week and Normative Annual Purchased Food Expenditure *(in 1988 cedis)*

Region	*Difference between effective and mean reported months* *(a)*	*Difference between mean two week expenditure and mean normative monthly expenditure* *(b)*	*Difference between mean reported months* mean normative monthly expenditure and mean normative annual expenditure* *(c)*	*Total difference* *(a)+(b)+(c)*
GLSS1				
Accra	-12661	5001	-5239	-12899
Other Urban	-6145	1536	-5806	-10415
Rural Coastal	-1456	-1851	-14323	-17630
Rural Forest	-6134	401	-2928	-8661
Rural Savannah	-1136	-5361	-1290	-7787
Côte d'Ivoire	-4169	-151	-4297	-8617
GLSS2				
Accra	-20024	14165	-3213	-9072
Other Urban	-8376	5738	-4934	-7572
Rural Coastal	-772	5090	-3762	556
Rural Forest	-2407	3143	-3265	-2529
Rural Savannah	1189	-8022	-418	-7251
Côte d'Ivoire	-3851	2480	-3485	-4856

Table B.4b Côte d'Ivoire: Decomposition of the Difference Between Two Week and Normative Annual Purchased Food Expenditure *(in 1985 CFAF)*

Region	*Difference between effective and mean reported months* (a)	*Difference between mean two week expenditure and mean normative monthly expenditure* (b)	*Difference between mean reported months* mean normative monthly expenditure and mean normative annual expenditure* (c)	*Total difference* (a)+(b)+(c)
1985				
Abidjan	-16759	10792	-2483	-8619
Other Cities	-9279	-1002	-6033	-16336
East Forest	192	5222	-5513	-41
West Forest	-2786	5590	-3517	-713
Savannah	-6997	556	448	-5993
Côte d'Ivoire	-7211	6173	-5542	-6602
1986				
Abidjan	-12878	1199	-878	-12557
Other Cities	-11064	13323	-3086	-827
East Forest	-4140	4721	-3170	-2589
West Forest	-3648	8354	-2925	1781
Savannah	-7263	7269	1085	1091
Côte d'Ivoire	-8471	8859	-3241	-2853
1987				
Abidjan	-15767	10401	-762	-6120
Other Cities	-12263	6299	-2392	-8359
East Forest	-1501	3939	-1378	1060
West Forest	786	11510	-4644	7652
Savannah	-6830	7063	-163	70
Côte d'Ivoire	-7865	8348	-2412	-1914
1988				
Abidjan	-14276	10355	-91	-4012
Other Cities	-4822	4664	-1970	-2127
East Forest	-4303	3436	1093	226
West Forest	-303	6237	-3310	2624
Savannah	-1321	4275	113	3067
Côte d'Ivoire	-4418	5901	-1493	-10

The second factor, the difference between the two week monthly estimate and the normative monthly estimate, is positive and large in Côte d'Ivoire, and somewhat more variable in Ghana, though still predominately positive. In general, we found that in regressing the log of two week monthly expenditure on the log of annual expenditure, the coefficient of annual expenditure was significantly less than one, but the magnitude of the intercept varied considerably. Thus, for some commodities, the slope coefficient dominated, so that predicted two week expenditure was less than normative monthly expenditure at practically all levels of expenditure, while for other commodities, predicted two week monthly expenditure exceeded normative monthly expenditure because of the large positive intercept. The latter was more commonly the case in Côte d'Ivoire.

The third factor is generally negative. Since the third factor is the covariance between the reported months and normative monthly expenditure multiplied by minus one, this means that the covariance between the number of months and the monthly purchase is generally positive in both Côte d'Ivoire and Ghana. This implies that households that declare a higher number of months of consumption tend to have higher monthly normative purchases. All other things being equal (e.g. reported months equal to effective months, and two week monthly purchases equal to mean normative monthly purchases), mean two week annualized expenditure would be less than mean normative annual expenditure. The reason is that multiplying two week consumption (on a monthly basis) by 12 in effect weights monthly expenditure equally across households, in contrast to the normative estimate, in which larger values of monthly consumption, multiplied by larger number of declared months, get weighted more heavily. In virtually all cases, the first two factors tend to offset each other, with the result that the negative value of the third decomposition factor dominates.

The results of the decomposition analysis also shed some light on whether or not the normative estimate is preferable to the annualized two week recall estimate. Both surveys indicate that mean reported months for purchased food are overestimated by households. This suggests that the two week annualized estimate would be preferable. The fact that the covariance between the reported months and monthly expenditure is very large, however, favors the normative estimate. If there is reason to think that the large covariance reflects a genuine phenomenon, in that households that declare a larger number of months of consumption also have higher average monthly purchase, then the procedure used to annualize two week expenditure would tend to be biased downwards. However, the normative estimate may be more prone to recall errors. If, for example, the normative estimate of monthly expenditure were systematically biased downwards, then one might prefer to use the short-recall period estimate. Since mean monthly short period and normative estimates are fairly close, however, this would suggest that recall bias is not large. Thus, the estimate averaging the two week recall and the normative estimates used in the 1985-1988 surveys may be a good compromise given the potential biases on both sides.

Comparing the declared months and the annualized estimates of food expenditure, 1993 and 1995

The 1993 and 1995 household priority surveys, as processed by INS, use a fourth method of estimating expenditures that is a cross between the short recall period and the normative annual estimate. Households were asked to value their purchases over the last week and the last month and how many months they purchased commodity. To derive the estimate of food expenditure, the estimated value of the monthly expenditure -- calculated by taking the average of the value of the previous week's expenditure, normalized for a month, and the previous month's expenditure -- was multiplied by the number of months during which the household purchased the item to obtain an annual estimate. This fourth method we call the "declared months*monthly value estimate" or simply the "declared months estimate."

The drawback of the "declared months* monthly value estimate" is that it underestimates the expenditure of households that report zero purchases over the last month but purchase the commodity at other months of the year. The number of households with zero monthly expenditure but positive annual expenditure is not insignificant. For example in 1995, for rice, 10 percent of the population reported zero monthly purchases but positive annual purchases, for cassava, 33 percent, for yam 24 percent, and for beef and chicken, 8 percent (see table B.5). The advantage of the declared months estimate, and reason it is used by the INS in constructing the aggregate expenditure variable in the 1993 and 1995 data, is that while it underestimates the expenditure of households with zero monthly expenditure but positive annual

expenditure, it does not distort the expenditure of the remaining households, in contrast to the method of multiplying expenditure over the previous month by 12 months.

Table B.5 Proportion of Population Reporting Zero Monthly Consumption but Positive Months of Consumption, 1995 Priority Survey

Product	*Percent*
Rice	10.4
Maize	27.1
Millet	13.1
Cassava	33.0
Yam	23.6
Plantain	19.4
Nuts	24.0
Vegetables	12.9
Fruit	20.2
Traditional oils	15.6
Beef/Fowl	8.2
Eggs	11.2
Sugar	0.1
Milk	0.0
Alcohol	3.0
Non-alcoholic beverages	0.4
Other foods	5.5
Bread	0.0
Macaroni	0.0
Cookies, Cakes	0.0
Fish	0.0
Butter	0.0
Salt	0.0
Tea, Coffee	0.0
Tomato paste	0.0
Foods prepared away from home	0.0

We conducted an experiment on the 1985-1988 survey data to ascertain how much difference there was between the "declared months*monthly value estimate" of purchased food expenditure and the two week annualized and normative estimates (table B.1). The monthly value is based on the two week recall estimate, put on a monthly basis. The mean of the "declared months*monthly value" method for Côte d'Ivoire is 6.6 percent lower than the two week annualized method on average between 1985 and 1988, and about 10.2 percent lower than the normative estimate. The difference in the poverty estimates between the "declared months* monthly value estimate" and the two week annualized or the normative estimate averages about 1.5 percentage points. While small, the differences are not inconsequential if one is tracking small changes in poverty over time.

We also looked at what would happen if we multiplied the 1993 and 1995 monthly estimates by 12 months, which we will refer to as the annualized estimate, instead of by the declared number of months (table B.6). For 1993, the declared months estimate is 3 percent lower than the annualized estimate, while for 1995, the declared months estimate is 13 percent lower than the annualized estimate. For 1995, the annualized estimate yields much lower poverty estimates than the declared months estimate (table B.7), particularly in the Savannah, because of the large increase in food purchases using the annualized method. Purchased food expenditures are 42 percent higher in the Savanah using the annualized estimate compared to the declared month estimate.

Table B.6 Comparison of the Annualized Monthly and the Declared Months * Monthly Value Estimates of Purchased Food Expenditure Per Capita for 1993 and 1995[a] *(in 1985 CFAF)*

	1993		*1995*	
Region	*Annualized monthly expenditure*	*Declared months * Monthly value*	*Annualized monthly expenditure*	*Declared months * Monthly value*
Abidjan	80128	77157	64992	62442
Other Cities	48839	48139	55300	50931
East Forest	28161	27319	38948	30421
West Forest	19847	18777	28704	25266
Savannah	17044	15829	36423	25512
Côte d'Ivoire	39669	38339	46022	40048

[a] Inkind food expenditure is not included in purchased food expenditure.

Table B.7 Comparison of the Headcount Index of Poverty Based on the Annualized Monthly and the Declared Months * Monthly Value Estimates of Purchased Food Expenditure for 1993 and 1995

	Headcount Index of Poverty			
	Annualized monthly purchased food expenditure estimate		*Declared months * monthly value purchased food expenditure estimate*	
Region	*1993*	*1995*	*1993*	*1995*
Abidjan	.040	.192	.051	.202
Other Cities	.308	.255	.312	.286
East Forest	.382	.355	.389	.410
West Forest	.372	.484	.382	.501
Savannah	.488	.393	.494	.494
Côte d'Ivoire	.315	.326	.323	.368

Decomposing the difference between the declared months and the annualized esitmates, 1995

The large difference between the annualized and the declared months estimate for 1995 merited investigation. We decomposed the difference between the two estimates using a breakdown similar to the one described above for the difference between the annualized and the normative estimate. The decomposition is as follows:

$$\bar{x}_{annualized} - \bar{x}_{declared} = \tag{4}$$

$$\bar{x}_{monthly>0} \cdot \left(\frac{12 \cdot n}{q} - \frac{\sum_{i=1}^{q} m^i}{q} \right) \tag{4a}$$

$$+\bar{m} \left(\frac{\sum_{i=1}^{n} x^i_{monthly>0}}{n} - \frac{\sum_{i=1}^{q} x^i_{monthly}}{q} \right) \tag{4b}$$

$$+\bar{m} \frac{\sum_{i=1}^{q} x^i_{monthly}}{q} - \frac{\sum_{i=1}^{q} m^i \cdot x^i_{monthly}}{q} \tag{4c}$$

where $x^i_{monthly}$ is the reported expenditure of person i during the previous month, and $\bar{x}_{monthly>0}$ is mean expenditure of the population reporting positive purchase of x during the previous month.

Similar to the analysis above, the first factor (4a) is the difference between the effective months and mean declared months. In the case of a survey such as the one in 1995 conducted during a short period of time, there is no presumption that the effective months and the mean declared months will be equal. This is a drawback of using the annualized method to estimate food expenditures for surveys conducted over a limited time period. If a survey, for example, takes place at a time when nearly everyone purchased a commodity, but there are other times during the year when households do not purchase the commodity, then the effective months would be much greater than the mean declared months. The reverse could also happen, so that this factor would have a negative sign. Of course, the difference between the effective

months and mean declared months could also result from a systematic recall bias in the number of months households declare, so one cannot distinguish the recall bias from the seasonal bias.

The second term (4b) is the difference between mean expenditure the previous month over the population reporting positive expenditures and mean expenditure over the population reporting a positive number of months, whether or not they had positive expenditures. The sign of this term will always be positive. It essentially reflects the magnitude of the bias introduced by the lack of correction in the declared months estimate for households with zero purchases but positive annual purchases. If one were to replace the value of purchases made over the previous month of those households declaring a positive number of declared months but zero monthly purchases with the mean of purchases made during the previous month of only those households declaring positive purchases, then this factor would vanish to zero.

Note that large positive (negative) values of the first term due to seasonal factors will be partially offset by smaller (larger) values of the second term. For example, if the effective months is larger than the declared months, that implies that there will be a smaller number of observations with zero purchases the previous month than would be the case if the mean effective months equaled the declared months. In this case the difference between the mean of monthly purchases over the population declaring positive monthly purchases and the mean of monthly purchases over the population declaring a positive number of months will be smaller than it would be if the mean effective months equaled the declared months.

The third factor (4c) is the covariance between the previous month's expenditure and declared number of months, multiplied by minus one. Based on the results for the 1985-1988 decomposition, we would generally expect the sign of this factor to be negative. A priori, neither the sign nor the magnitude of the difference between the declared months and the annualized estimates can be predicted since the signs of (4a) and (4c) are indeterminate.

Table B.8 shows the decomposition of the difference between the annualized and the declared months estimates of purchased food expenditures for 1995.[5] In all but one region (West Forest), the first term in the decomposition is positive, indicating that the effective months is greater than the mean declared months. Thus, there are fewer households with zero purchases the previous month but positive declared months than would be expected from the mean of declared months. This could be due to a seasonal effect or to a recall bias such that households underestimate the number of months they consume a commodity. To the extent that it is due to a seasonal bias, the declared month estimate would be preferable; if it reflects recall error then the annualized estimate would be preferable.

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[5] We also decomposed the difference between the annualized and the declared months estimate of purchased food expenditure for 1993. In the 1993 survey, the declared months was equal to 12 and monthly purchases were equal to zero for some households. Under the assumption that this was a mistake (see Annex 3), we revised the number of months in such cases to be equal to zero. The decomposition showed that the covariance between the declared months and monthly expenditure was positive in all regions, so that the third factor in the decomposition was negative. Also for the rural areas, the first factor in the decomposition was negative, implying that the effective months was less than mean declared months. Thus, there were more zero observations for monthly food purchases than would be expected according to the mean of the declared months. This is possibly in part an artifact of the apparent mistake made in filling out the questionnaires in which the number of months of consumption of home production were recorded under the number of months of purchase. The first and third factor almost completely offset the second factor, so that there is very little difference between the annualized and the declared months estimate of purchased food expenditure.

Table B.8 Côte d'Ivoire: Decomposition of the Difference Between Two Week and Normative Annual Purchased Food Expenditure in 1995 *(in 1985 CFAF)*

Region	*Difference between effective and mean reported months* (a)	*Difference between mean two week expenditure and mean normative monthly expenditure* (b)	*Difference between mean reported months* mean normative monthly expenditure and mean normative annual expenditure* (c)	*Total difference* (a)+(b)+(c)
Abidjan	3663	129	-1242	2550
Other Cities	4180	1182	-992	4370
East Forest	720	7321	485	8526
West Forest	-7093	11571	-1039	3438
Savannah	757	9163	992	10912
Côte d'Ivoire	2022	5047	-1095	5974

The second factor is positive, as expected, and large in the three rural regions. This is also what one would expect, since households in the urban areas are more likely to purchase 12 months out of the year. Thus there would be fewer instances in urban areas of households with zero purchases the previous month but a positive number of declared months. This factor essentially represents the magnitude of the underestimate due to the lack of correction for households with zero purchases the previous month but positive declared months. The third factor, the covariance multiplied by minus one, is relatively small, and negative in the urban regions, and positive in two of the three rural regions. All in all, the biggest factor is the second one, indicating that the declared months estimate of purchased food underestimates purchased food expenditure due to the lack of adjustment for households with zero purchases the previous month but a positive number of months of expenditure.

Estimating food expenditures across surveys using comparable methods

To estimate purchased food expenditures in the 1985-88 and the 1993 and 1995 surveys in a comparable fashion, we could use the estimate of purchased food over the past months in the 1993 and 1995 surveys multiplied either by the declared number of months or by 12 months and pick the corresponding estimate (the two week*declared months or two week annualized estimate) for 1985-88. As noted above, the drawback of using the "declared months* monthly value" estimate is that it makes no correction for households that purchase a commodity at some point during the year outside the survey period. With respect to the 1985-1998 surveys, the annualized estimate would be preferable to the declared months estimate since it corrects for the households with zero monthly purchases but positive annual purchases. Because the 1985-1988 surveys were conducted over the course of a year, in principle there would be no seasonal bias leading to a difference between the effective months and reported months. However, the annualized estimate is subject to the potential bias created by the large non-negative covariance between the number of months of consumption and previous month's expenditure.

With respect to the 1993 and 1995 surveys, the possible existence of a seasonal bias leading to a difference between the effective months and mean declared months remains a drawback of the annualized estimate, as does the nonzero covariance between the monthly estimate and the declared months. Moreover, the fact that the 1993 and 1995 took place over different periods of time -- six months in the case of the 1993 survey and two months in the case of the 1995 survey -- and at different points of the year

imply that the difference between the effective and declared months would neither be necessarily of the same magnitude nor in the same direction. The procedure used to adjust total expenditure in 1993 and 1995 for seasonal effects described in the main paper partially corrects for an unusually high or low level of purchases during the survey recall period. However, it is an imperfect correction, since the food subaggregate in the total expenditure aggregate for 1985-1988, on which the seasonal correction factors are based, is the estimate which averages the two week annualized and the normative estimates. Thus, it does not correspond presicely to either the monthly annualized estimate or the "declared months*monthly value" estimate in the 1993 and 1995 data.

Table B.9 shows the seasonally adjusted poverty estimates for the annualized and the declared months method of estimating food expenditure. Even with the seasonal adjustment to the annualized estimate, the large decrease in poverty in the Savannah apparent in the annualized estimate remains between 1993 and 1995.

Table B.9 A Comparison of the Seasonally Adjusted Headcount Index of Poverty Based on the Annualized Monthly and the Declared Months * Monthly Value Estimates of Purchased Food Expenditure, 1995

Region	*Annualized monthly value estimate*	*Declared months * monthly value estimate*
Abidjan	.192	.202
Other Cities	.249	.275
East Forest	.307	.383
West Forest	.503	.532
Savannah	.432	.509
Côte d'Ivoire	.323	.367

For the purposes of analyzing the trend in poverty between 1988 and 1993, it matters relatively little which estimate we use since the increase in poverty between 1988 and 1993 is very large. The diffference in the headcount index in 1988 and 1993 due to the switch from the annualized to the declared months method -- about one percentage point -- is dwarfed by the huge increase in poverty of about 15 percentage points between 1988 and 1993 in both methods.[6] Had the increase in poverty been much smaller, the issue of using comparable methods of estimating food expenditure would have had more salience. However, the choice of method makes a big difference for the change in poverty between 1993 and 1995, as the annualized method results in a much higher estimate of purchased food expenditure and thus a much smaller increase in poverty in 1995. The aggregate used by the INS is the "monthly value*declared months" estimate, but a good case could be made for using the annualized estimate, despite its drawbacks.

[6] For the poverty indicators for 1985-1988 based on the poverty line of 75,000 CFAF (in 1985 CFAF), see Table 2.

Construction of the price deflators

To construct a price deflator series for the 1985-1995 surveys, the consumer price indices published by the National Statistical Institute (INS) of Côte d'Ivoire were used.[7] The index used by INS to construct the deflators for the poverty series is a weighted average of the index for Abidjan white collar employees (weight of 0.2) and blue collar employers (weight of 0.8). The consumption weights for the CPI index are derived from a household budget survey undertaken in 1979. For the period spanning the 1985-1988 surveys, the base period prices are the average of the monthly prices between August 1984- July 1985. In 1993, the CPI series was rebased using the prices prevailing over the period November 1992 to October 1993. Moreover, at the time that the prices were rebased, the method of collecting price information on goods changed from interviewing of sellers to actually purchasing the goods in local markets. This resulted in somewhat lower prices than was previously the case.

To create the deflators for the poverty surveys, the following procedure was followed. For the surveys conducted between 1985 and 1988, the deflators are the average of the monthly price indices for the period of each survey. In 1993 and 1995, the price deflators for the two surveys were calculated by computing the average price index in the new base prices for the two survey periods. These deflators were transformed into the 1984/85 base prices by multiplying by the coefficients derived by INS to link the 1984/85 base price index with the 1992/93 base price index. Table B.10 compares the price deflators for Abidjan used by Grootaert (1995) and the INS deflators. Grootaert's series differs from the INS series for the 1985-1988 period because the calendar year deflators he used differed from the INS CPI series, and also because the INS deflators for surveys are based on the average of the monthly indices for the period covered by the surveys rather than the average calendar year index as assumed by Grootaert.

Table B.10 Price Deflators for Côte d'Ivoire Household Survey

Deflators	*1985*	*1986*	*1987*	*1988*	*1993*	*1995*
Grootaert (1995)	100.00	107.30	107.75	115.31		
INS	100.00	108.96	117.00	124.43	135.12	193.11

The regional price deflators for the rural East Forest, West Forest, and Savannah regions were derived as follows. A regional price deflator series was derived by Grootaert and Kanbur (1994) for 1985 based on ICP data and was recalculated for the years 1986-1988 based on each year's expenditure shares. This resulted in variation in regional price deflators between 1985-1988, particularly for the West Forest and Savannah due to shifts in the expenditure pattern. In view of the fact that 1985 appeared to be an outlier, INS averaged the 1986-1988 regional indices. The regional deflators thus assume constant expenditure shares.

For Other Cities, INS used their recently established price index to derive a regional deflator. The ratio of the Other Cities to the Abidjan price index indices for the March - May 1993 period yields the regional deflator for Other Cities. [8] The drawback of using the INS price index is that it is not strictly

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[7] For a discussion of the construction of the deflators, see Institut National de la Statistique (1996).

[8] As the price index for Other Cities is based on January - December 1993 prices, it was necessary to rebase the price index for Abidjan for the March - May 1993 survey period to the January - December 1993 period.

comparable to the method used to establish the other regional deflators, which are based on the prices prevailing in 1985 based on the ICP survey.

Table B.11 compares the regional price deflators used deflators used by Grootaert (1995) and the revised INS deflators and table B.12 compares the poverty estimates based on the Grootaert (1995) deflators and the revised INS deflators for the period 1985-1988. The poverty estimates are based on the poverty line of 128,600 CFA in 1985 Abidjan prices used by Grootaert. The revised INS deflators yield higher estimates of poverty, particularly in the outer years, due to the large change in the temporal price deflators.

Table B.11 Côte d'Ivoire Regional Cost-of-Living Index, 1985-88

A. Regional Deflators - Grootaert (1995)				
Region	*1985*	*1986*	*1987*	*1988*
Abidjan	100.00	100.00	100.00	100.00
Other Cities	92.84	93.62	91.49	92.57
East Forest	87.01	87.01	88.12	86.58
West Forest	78.25	74.66	75.64	72.42
Savannah	75.97	80.12	81.86	81.88

B. INS Revised Regional Deflators used in surveys	
	1985-1995
Abidjan	100.00
Other Cities	96.38
East Forest	87.24
West Forest	74.24
Savannah	81.29

Table B.12 Comparison of Headcount Index of Poverty Based on Grootaert and INS Deflators. *(Poverty Line=128,600 CFA, in 1985 CFAF).*[a)]

	1985		*1986*		*1987*		*1988*	
Region	*Grootaert*	*INS*	*Grootaert*	*INS*	*Grootaert*	*INS*	*Grootaert*	*INS*
Abidjan	0.034	0.034	0.166	0.168	0.074	0.129	0.139	0.165
Other Cities	0.236	0.250	0.223	0.242	0.224	0.293	0.410	0.480
East Forest	0.479	0.481	0.395	0.401	0.435	0.472	0.494	0.545
West Forest	0.178	0.143	0.203	0.207	0.376	0.483	0.553	0.593
Savannah	0.502	0.540	0.481	0.492	0.578	0.623	0.652	0.711
Côte d'Ivoire	0.301	0.307	0.300	0.309	0.348	0.406	0.459	0.510

[a)] See table B.10 for the two series of deflators.

References

Grootaert, Christiaan. 1995. "Structural Change and Poverty in Africa: A Decomposition Analysis for Côte d'Ivoire." *Journal of Development Economics*, 47:375-401.

Grosch, Margaret, Qing-hua Zhao and Henri-Pierre Jeancard. 1995. "The Sensitivity of Consumption Aggregates to Questionnaire Formulation: Some Preliminary Evidence from the Jamaican and Ghanaian LSMS Surveys," Washington, D.C.: The World Bank.

Institut National de la Statistique, prepared by Ouattara, I. 1996. *Profile de pauvreté en Côte d'Ivoire 1993 et 1995.* Ministère du Plan et du Développement Industriel, Abidjan, Côte d'Ivoire.

World Bank. 1995. *Côte d'Ivoire Living Standards Survey (CILSS) 1985-88.* PRDPH/AFTHR Draft document, The World Bank, Washington, DC.

Appendix C: Corrections to the 1993 Data Set

This note describes the changes that were made to the working INS files to produce the 1993 data set. The major problem with the data set was the computer coding error that affected the consumption of home production variable.

Consumption of home production

The consumption of home production is calculated by multiplying the amount consumed per day by days per month by months per year (variables s8hq8*s8hq6*s8hq7 in the 1993 data set). However, it was found that 98% of months of consumption (s8hq7) were entered as 1, which is not realistic (see table 22). Based on an inspection of eight questionnaires that were available, the number of months of home consumption was incorrectly entered on the computer data file. In the absence of the entire set of 9600 questionnaires, corrections were made to the data set as follows.

The inspection of the eight questionnaires revealed that the number of months of consumption of home produced food was generally the same as the number of months of declared food purchased in the case when the declared amount of purchased food over the last week or month equaled zero. Whether these cases arose because households actually purchased food some months of the year (but not the month in which the household was surveyed), or because of mistakes in recording the response is not clear. However, it is likely that the latter was the case in many instances, since there were a number of cases in which a household declared 12 months of purchasing food, but reported no purchase during the month of the interview. In any event because of the close correspondence between the number of months of purchase and the number of months of consumption in the few questionnaires that we were able to examine, we decided to use the number of purchased months to correct the number of months of consumption of home produced food. We proceeded as follows.

For households in which monthly purchases were zero, but number of months of purchase were positive, we replaced by the number of months of consumption of home produced food by the number of months of purchased consumption, if the number of months of home consumption was less than the number of months of purchased. The number of months of home consumption was almost always less than the number of months of purchased consumption, since months of home consumption was usually equal to 1. This correction affected 19,597 cases, leaving unchanged 434 cases in which purchased months were greater than zero but purchases equaled zero.

For households in which monthly purchases were greater than zero and months of purchase were also greater than zero, we set the number of months of home consumption equal to 12 minus the number of months of purchase. This correction was based on the modal pattern in the 1995 data (see table C.1). The only exception was if the months of purchase equaled 12. In that case, we took the median number of months of home consumption, which was 10. This correction affected 3570 cases.

Table C.1 Comparison of Months of Purchased Food and Home Produced - Food

Months of purchased consumption	*Months of consumption of home production*											
	1	*2*	*3*	*4*	*5*	*6*	*0*	*8*	*9*	*10*	*11*	*12*
1	0	1	1	0	0	1	0	0	0	1	5	2
2	3	3	2	2	1	1	0	1	1	32	0	1
3	5	11	1	1	1	1	0	1	25	1	0	0
4	4	10	8	7	0	0	0	59	0	0	0	2
5	1	2	2	4	6	2	22	0	0	0	0	0
6	3	6	7	13	4	78	0	0	0	0	0	0
7	0	3	7	6	31	0	0	0	0	0	0	1
8	0	1	3	26	1	2	0	3	00	0	0	0
9	0	0	21	0	1	2	1	0	2	0	0	0
10	0	31	3	2	0	0	1	0	0	5	0	2
11	11	0	0	0	0	1	0	0	0	0	0	0
12	5	26	24	32	25	58	18	19	12	21	2	201

For those households in which no purchased months were recorded, the number of months of consumption of home production was set equal to the mean number of months of home consumption of the remainder of the sample, after corrections had been made to the number of months of home consumption for those households. The correction was done on a commodity-specific and region-specific basis. The means were calculated separately for households that reported that they consumed the home-produced good 1 to 15 days per month, and those that consumed 16 to 30 days per month. This correction affected 1921 cases.

The other correction that was made to the consumption of home production variable concerned household 47426 and the variable s8hq3 (How much did you buy last month), which was coded as 12 for food items 8, 9, 10, 11, 12, but with zero months of consumption of home production. It was likely that the two column were transposed in entering the data. To correct this likely error, household 47426's the number of months of purchased food were coded as 12 instead of zero for items 8, 9, 10, 11, 12. Another household, number 20216, also reported positive monthly purchases for two commodities, but zero months of consumption. However, it was not obvious how to correct this error, so no change was made.

Purchased food consumption

No correction was made to the data file except for two households (menage 12031 and 15309). These two households reported positive monthly expenditure on leafy vegetables (s8hq1a=14) and game hen (s8hq1a=17) but 0 months of purchased food. We replaced months with 12 and 1 respectively for these two households.

In-kind food consumption

We aggregated in-kind food consumption with purchased food consumption in both the 1993 and 1995 data. This reduced the number of households in 1993 with no food consumption from 107 (excluding the three households that have missing region and other data) to 37. The cleaning procedure for outliers was then run on this new aggregate. For the 37 households that still had zero food consumption, we replaced the zero values by mean regional

purchased food consumption of the cleaned data. The means were calculated based on the sample of households with 6 or less persons, since most of the households with no food consumption have six or less persons.

The cleaning procedure for outliers was then run on the remainder of the subaggregates. Since there were less than 100 observations for non-food in-kind subaggregate for Abidjan, visual inspection was used to correct for outliers. For households 6832 and 3834, per capita nonfood in-kind expenditure (206700 and 80613, respectively) was replaced by 68496, the upper bound of Abidjan's non food in-kind values.

Other changes to the 1993 data

There were three households (numbers 529, 2236, 4936 in sec8h123 file-- food consumption data file), but not in sec1b (household roster file). They were eliminated from the final aggregated data set.

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